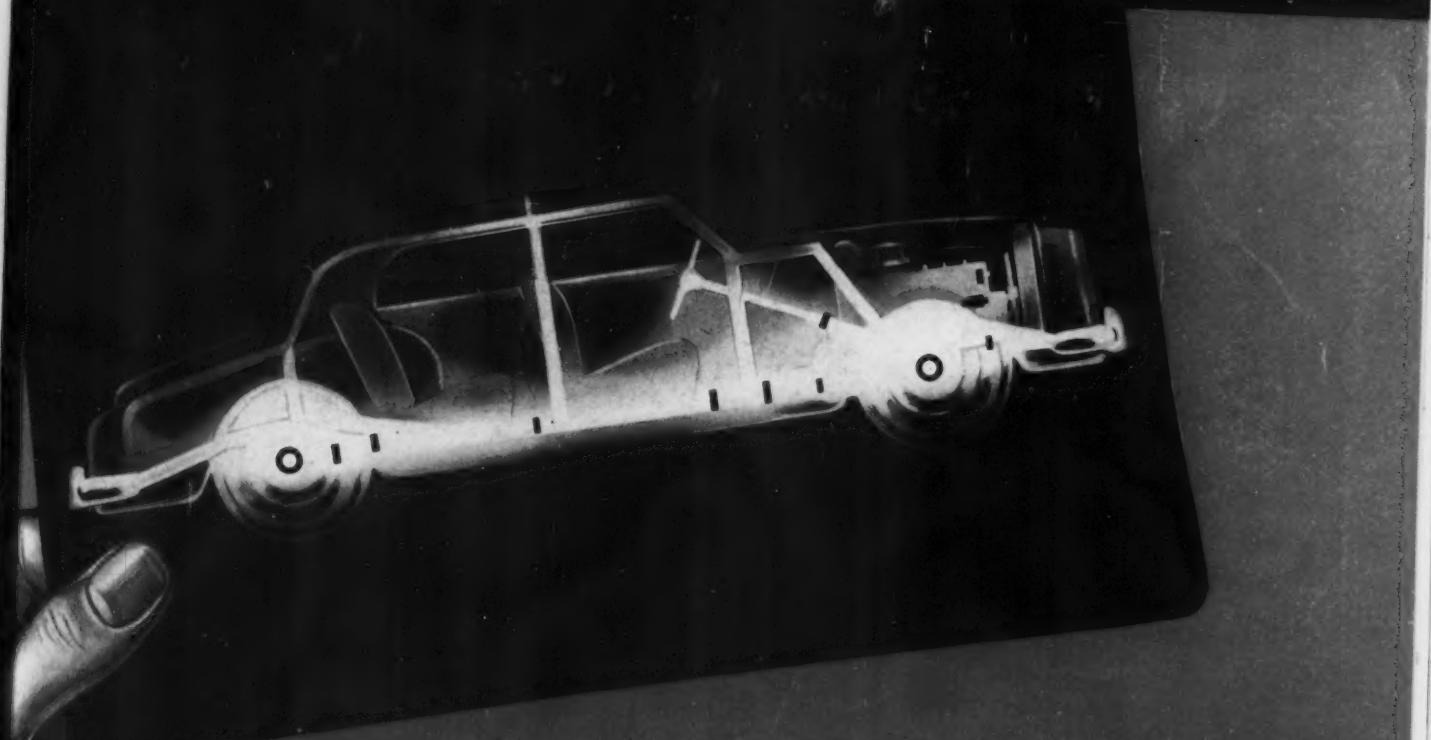


THE IRON AGE

ENGINEERING LIBRARY THE NATIONAL METALWORKING WEEKLY

February 16, 1950
FEB 18 1950

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When you examine and admire the new models at the winter shows, you'll see many of the devices that make automobiles so dependable today. But not all of them!

You can't see the amazingly accurate New Departure ball bearings beneath the gleaming chrome and lacquer of the new cars. Located where they are, by engineers who

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89 FC

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Yes, in the new Whiting Crane, the operator moves the crane and load *with his fingertips*—and *remains comfortably seated* during all crane operations.

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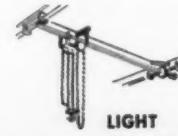
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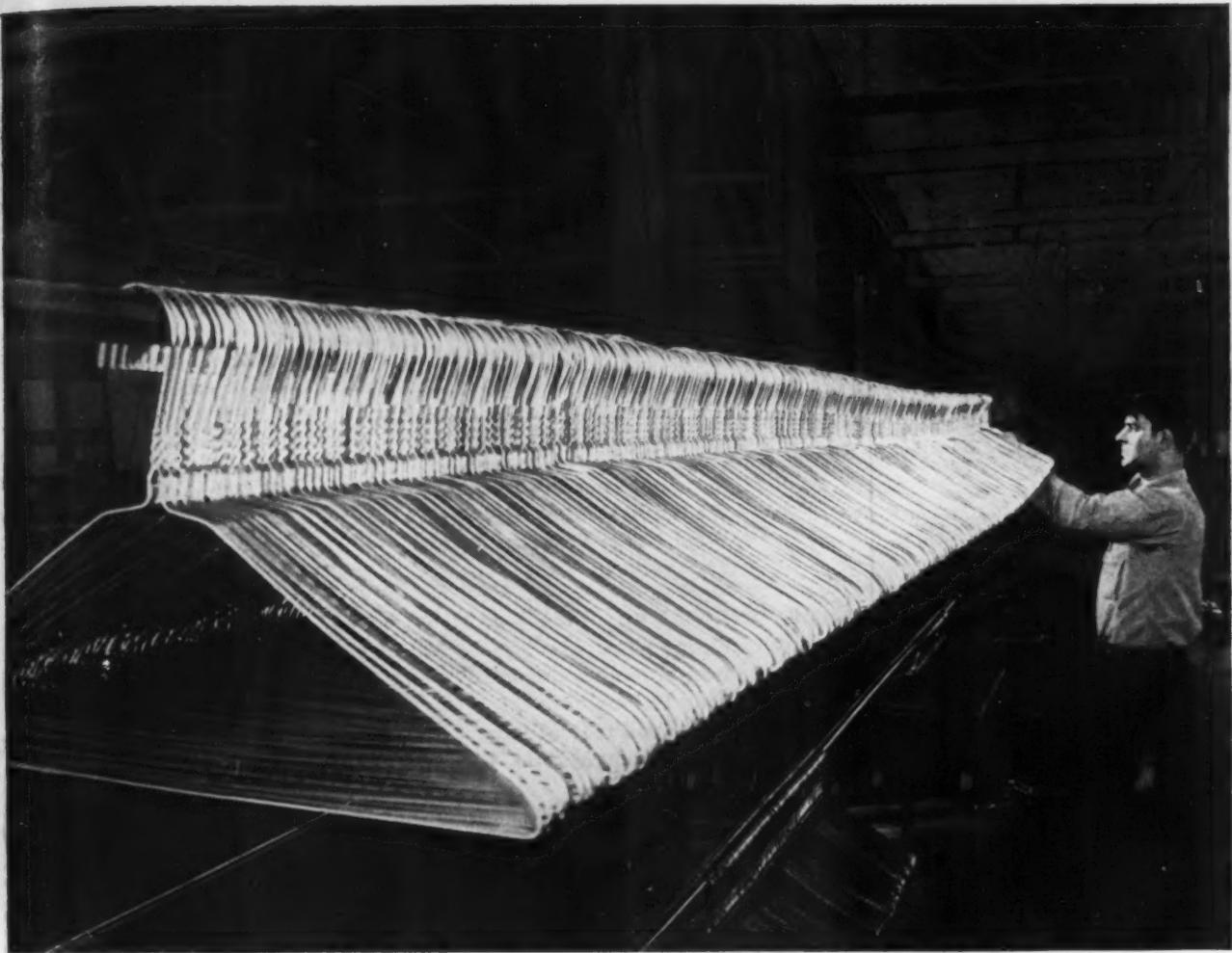
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Feb



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THE IRON AGE

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Special Article



Deep drawing copper, aluminum, brass, magnesium, and carbon and stainless steel sheet is practically always facilitated by drawing lubricants. Knowing and using the correct lubricants for the press drawing of each specific metal is the requisite for better deep-drawn metal products.—p. 83.

Issue Highlights



The properties of common magnesium casting alloys poured into investment molds have been recently determined through an investigation undertaken at Materials Laboratory, Wright-Patterson Air Force Base. These mechanical properties compared favorably with the mechanical properties of these alloys when sand cast.—p. 94.



The precautionary steps that must be taken for successful forging of stainless steels depend upon a thorough knowledge of the inherent characteristics of the particular grade. This knowledge will lead to correct procedures in the critical phases of forging preheating, forging practice, and heat treatment.—p. 100.



Steel supply looms as the major hurdle for the fastener industry. Demand for headed and threaded products for the first half of this year appears to be equal to or better than 1949's estimated 296,000 tons valued at \$102 million.—p. 111.



Heavy industrial use of water is contributing to the problem of water shortages in every section of the country. The real cause is lack of proper planning. In most cases future needs can be met if planning is adequate.—p. 113.



The 79th annual meeting of the American Institute of Mining and Metallurgical Engineers, held in New York this week, was the most extensive to date. D. H. McLaughlin is the new president. Gold medal awards were presented to nine experts.—p. 117.

Coming Next Week



Welfare enterprise is the only thing that can halt the trend toward the welfare state. A growing group of enlightened management recognizes this. By trial and error, they have learned that an effective educational program is the key to any management program aimed at improving human relations. An IRON AGE Special Report.

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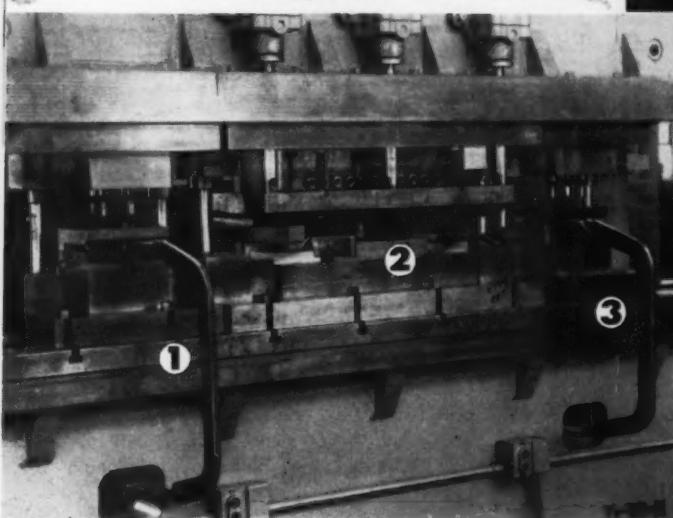
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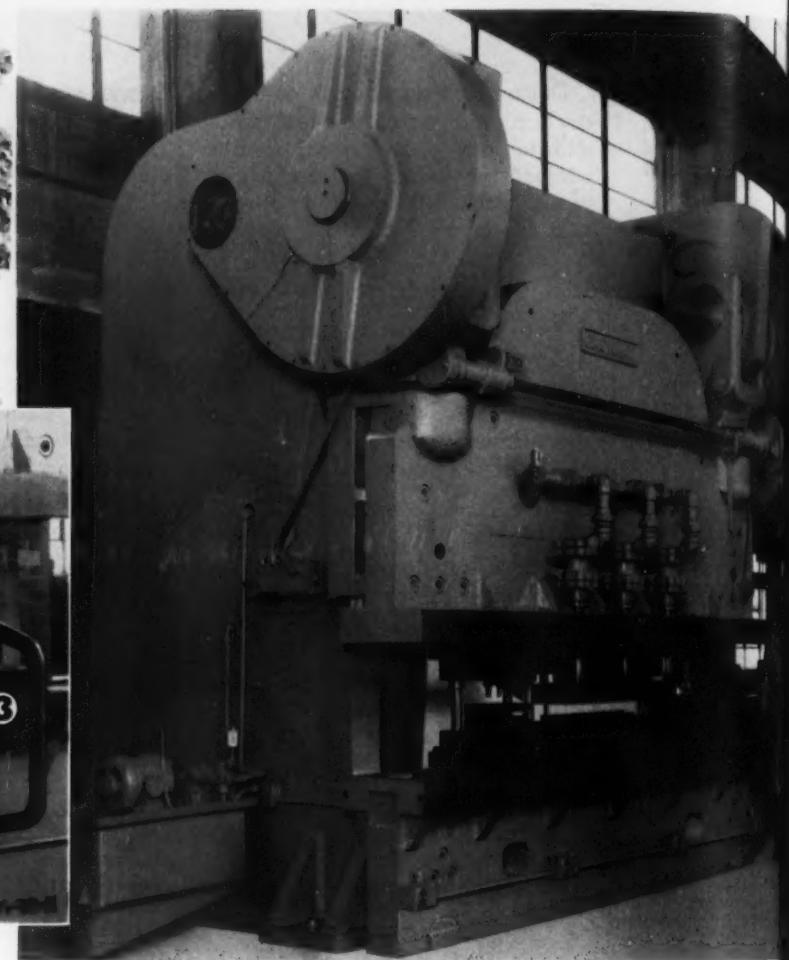
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Indexed in the Industrial Arts Index and the Engineering Index. Published every Thursday by the CHILTON CO. (INC.), Chestnut and 56th Sts., Philadelphia 39, Pa. Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. \$8 yearly in United States, its territories and Canada; other Western Hemisphere Countries \$15; other Foreign Countries \$25 per year. Single Copies 35¢. Annual Review Number, \$2.00.

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Editorial

INDUSTRY VIEWPOINTS

"... All Appropriate Action . . ."

THE predicament in which John L. Lewis now finds himself reminds us of what once happened to a friend of ours. As plant superintendent of a big machine shop he got the word from the boss to "Clean up that mess in B-bay right away!" He called in the maintenance chief and told him the boss wanted the mess in B-bay cleaned up right away.

Next day our friend strolled through B-bay. No one was working there so he strolled on back to the office and read the paper. He kept this up for a couple of days. After all, he figured that he *had* told the maintenance chief to do the job. He had carried out the boss's orders. Next day he was fired. On his way to the cashier's desk he heard the boss muttering something about "following through."

The background is this: The plant superintendent and the maintenance chief were old buddies from away back. Neither of them liked the boss and each knew how the other felt. Besides, where were they going to put all that stuff that was stacked up in B-bay?

Early this week John L. Lewis was in just that spot. He had been handed a court order telling him to end the coal strike. The order used strong language. It directed him to "forthwith instruct and take all appropriate action as may be necessary to insure that such instructions are carried out." The part about "all appropriate action" is unusual in such orders. It looks as if the court suspected that Mr. Lewis might pay it lip service only.

And it looks now as though the court were right. The miners were "instructed" by Mr. Lewis to return to work. The order conveying the instructions went through the district directors of the United Mine Workers locals. Mr. Lewis made no bones about the fact that he was forced by a court order to issue it.

But the fact is that a lot of miners didn't think Mr. Lewis wanted them to go back to work. These men said that if he really wanted the strike halted he would have made that plain. He can talk plainly when he wants to—he can express himself clearly or vaguely as he chooses. He has done it in the past.

If this impasse is not ended soon a lot of people will question whether the mine union head has taken "all appropriate action" to resume coal production. They are going to wonder whether Mr. Lewis' back-to-work order was countermanded in advance and whether it is possible to disobey a court order by a wink and a nod.

Tom C. Campbell

Editor



stainless steel

High Production Is Scheduled

Industry Is Gambling on Coal

Steel Demand Growing Tighter

The Iron Age

SUMMARY

IRON AND STEEL INDUSTRY TRENDS

STEEL producing and fabricating plants this week are scheduling a high rate of manufacturing. They are gambling on an early resumption of coal shipments. If they lose, and there is another week of no coal mining, major segments of the nation's industry will shut down with a bang.

Steelmaking operations this week are scheduled at 89 pct of capacity, off only two points from last week. Some plants are keeping steelmaking operations hovering around the nineties, despite the fact that blast furnace operations have already been cut drastically—in some cases more than 50 pct. They are able to do this by increasing the charge of scrap in both blast furnaces and openhearths.

Demand for steel continues at a very high level. Steel company sales meetings this week reflected an even more optimistic tone than had been the case in recent weeks. Demand for cold-drawn bars, hot-rolled bars and wire products showed an upturn. Several companies have orders and commitments on flat-rolled items sufficient to carry through the second quarter.

How Firm Are Steel Orders?

A major producer of carbon bars reported that there is some indication that sustained demand will continue for an even longer period than had been anticipated. It is still true that there is a stronger demand in the West than in the East, indicating that demand probably will hold up longer in the West. An easing of demand for large bar sizes in the East was noted.

How much of this intense demand is due to jittery consumers seeking to get on order books because of the threat of a steel shutdown for lack of coal is the big question bothering steel sales executives. Customers offer little help in answering this question as all insist that their orders are based on real needs.

One thing is certain, steel's best customer, the auto industry, is going to push output as long as the steel supply holds out and auto demand

holds up. Although the Chrysler strike has idled about 150,000 workers, including 89,000 strikers, other firms are driving for the biggest possible share of the market. These firms, including parts suppliers, are not following General Motors restriction on overtime in its assembly plants.

Some Steel Sources Still Open

Should the coal crisis continue and force further curtailment of steelmaking, there are three limited sources of steel supply open to consumers: (1) Warehouses, (2) steel company stocks and (3) conversion. But these sources cannot supply as much as they did during the steel strike last fall.

Warehouses are unanimously in short supply of flat-rolled items, especially hot-rolled, cold-rolled and galvanized sheets. A few warehouses are already completely out of popular sizes and gages of these items. Some other items are in comparatively good supply. These include structural, plates, hot-rolled bars and cold-drawn bars.

Steel companies which had to deplete their inventories to satisfy customers following the strike have not been able to replenish them because of persistent demand. Although small, tonnagewise, Conversion steel is playing an important role in the automotive drive for high production. Some companies will be able to turn out conversion ingots even if blast furnaces are shut down.

Productivity Is High

Although January output of 7.9 million tons of raw steel is not a record, it is the highest output in any month since March 1949. With their own labor difficulties settled, steel management and labor have been going all out to maintain production at a high level. Several companies established all-time records in some mills and departments during the month. Worker morale and productivity is reported high. Scrap activity is slower than had been expected. The market is dull, with a weak undertone.

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IMPACT RESISTANCE

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Fatigue Cracks

By *Charles T. Post*

Spectrum

Several weeks ago Eugene M. Smith of Youngstown Sheet & Tube dropped the incidental query: "Do red 3¢ stamps confuse you, too, after living with red 2¢ stamps for so long?"

Actually, we'd been so fascinated with the pictures on the stamps, ranging from the great American hen to the great American banker, that we hadn't noticed the color.

But consider for a moment a bill dropped into the hopper by Congresswoman Edith Nourse Rogers which would call for calling in all U. S. currency, and reissuing it with "new and different colors" for each denomination.

Mrs. Rogers is probably an avid interior decorator, and we concede her right to turn the painters and drapery makers loose on her apartment every other week if she wants to. But when she wants to play a color symphony with our cash, that's when we part company.

It's tough enough to keep our major-domo of the market basket supplied with green shoes to match her green hat and blue purses to match blue suits without having her come out with, "Darling, you'll just have to give me a mauve twenty today; that violet ten you gave me yesterday clashed horribly with my new ensemble so I gave it to the Salvation Army."

Here we are just getting used to the dollar being worth 60¢. If the

hobby fans evaluate currency the way they do postage stamps, we'll find that a common blue dollar bill is worth only 3¢ while a rare deep magenta single brings \$285 on the black market.

For our money, we haven't tired of collecting portraits of G. Washington backed by green, with an occasional view of A. Lincoln, or the White House with the new balcony. A psychiatrist explained it to us once by saying that green is such a soothing color.

Cybernetics

To show you your f.f.j.'s readers know everything, we've already had four readers come up with slightly varying definitions of "cybernetics," all of them referring us to Dr. Norbert Wiener of M.I.T. Dr. Wiener fools around with mechanical brains that come up with answers to complex problems almost as quickly as child prodigies, but in a less offensive manner. R. Cruikshank of Portsmouth, N. H., says Dr. Wiener wrote a book entitled "Cybernetics," defined as "communications-and-control engineering putting equal emphasis on physiology and engineering." W. H. Hagedorn of New York City encloses a clipping which refers to cybernetics as "the science of the relationship of human and mechanical brains." R. F. Meyers of St. Louis was the first to point out

Turn to Page 172

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Published to assist those planning new or expanded heat treating departments. It's yours for the asking.

Material contained in this 24 page booklet, prepared by the Lindberg Engineering Company, is based upon years of experience in helping design hundreds of toolrooms . . . plus additional information gained from the 24-hour-a-day operating experiences of the toolroom heat treating department of the Lindberg Steel Treating Company, the world's largest.

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To get your copy write or call your nearest Lindberg Engineering Company office or the Lindberg home office at 245, West Hubbard Street, Chicago 12, Illinois.

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LINDBERG FURNACES

Iron Age *Introduces*



JOHN C. EWER, assistant general manager, Norton Grinding Wheel Co., Ltd., Welwyn Garden City, Herts, England.



W. R. ELLIOT, vice president in charge of employee and public relations, Jones & Laughlin Steel Corp.



V. H. LAWRENCE, vice president in charge of planning and control, Jones & Laughlin Steel Corp.

John C. Ewer, Norton Co. abrasive engineer in the Boston district, has been appointed assistant general manager of NORTON GRINDING WHEEL CO., LTD., Norton's branch plant in Welwyn Garden City, Herts, England. He will leave for England to take over his new responsibilities about May 1. **Raymond J. Forkey**, abrasive engineer in Rochester, N. Y., will take over the district vacated by Mr. Ewer.

E. F. Brooks was elected to the position of vice president and general manager of Lobdell United Co., Wilmington, Del., a subsidiary of the UNITED ENGINEERING & FOUNDRY CO., Pittsburgh. He was also made a director of Lobdell United. Mr. Brooks has been the assistant superintendent of the New Castle plant since 1944.

W. R. Elliot, formerly general superintendent of JONES & LAUGHLIN'S Otis Works, was elected vice president in charge of employee and public relations, succeeding **V. H. Lawrence**, whose new appointment is announced in the adjoining column.

Hugh C. Land, assistant to the production manager of the PENNSYLVANIA SALT MFG. CO., was appointed production manager. In his new capacity, Mr. Land will exercise general supervision over operation of the manufacturing facilities of the parent company, including utilities.

S. E. McGinnis was appointed communications engineer, with headquarters at Oelwein, Iowa, for the CHICAGO GREAT WESTERN RAILWAY CO. He succeeds G. R. Hoisington who was assigned to other duties.

V. H. Lawrence, vice president in charge of plant development and employee and public relations, JONES & LAUGHLIN STEEL CORP., Pittsburgh, was transferred to the newly created position of vice president in charge of planning and control.

John J. Cole was appointed manager of the industrial department of SANDERSON & PORTER, engineering and construction firm of New York.

Ernest M. Knapp has been elected treasurer and assistant secretary, FERRO MACHINE & FOUNDRY, INC., Cleveland. He succeeds N. E. Gauthier who is retiring because of ill health. Mr. Knapp joined Ferro in 1933 and has been assistant treasurer since 1946.

Iron Age Salutes

H. V. CHURCHILL



JAMES H. BINGER, vice president and general manager, Belfield Valve division, Minneapolis-Honeywell Regulator Co.

James H. Binger was elected vice president and general manager of the Belfield Valve division of MINNEAPOLIS-HONEYWELL REGULATOR CO. Mr. Binger will have charge of engineering and manufacturing in the valve division and will coordinate valve sales through other divisions of the company.

George B. Koch, former advertising and sales promotion manager, has been appointed staff representative for chemical sales to direct the promotion of agricultural chemicals, B. F. GOODRICH CHEMICAL CO., Cleveland. F. L. McNabb was appointed staff representative for Hycar and rubber chemicals. Named successor to Koch as advertising and sales promotion manager is M. W. Osborne, Jr.

Turn to Page 144

HE is one of those rare personalities who work like the devil but make it look easy. And, happily, he hasn't yet learned to take himself seriously. Probably never will.

He'll work his head off to put over any worthwhile community project, whether it's a community fund campaign or any other civic betterment program. He thrives on that sort of thing. Besides, he's a good chess player and likes nothing better than to take on half a dozen challengers at once. Usually beats them, too.

Ask around New Kensington, Pa., about H. V. Churchill and the chances are you'll learn that he's the fellow who writes the funny jingles. Or the popular after-dinner speaker who has a collection of funny stories longer than your arm.

As chief of the analytical chemistry division of the research laboratories, Aluminum Co. of America, Mr. Churchill is a scientist of considerable standing in this country and abroad.

Fellow chemists in the Pittsburgh district demonstrated their appreciation of his accomplishments by awarding him the 1949 Pittsburgh Award for distinguished service to chemistry. In his 30 years as a chemist he so improved and standardized analytical methods for aluminum and aluminum alloys that his procedures are accepted not only within his own company but by chemists and metallurgists generally.

Funny thing, though—and Mr. Churchill would be the first to



acknowledge the truth of this—he is likely to be remembered longer and by more people for his contribution to dental health than for his accomplishments in metallurgy, important as that is.

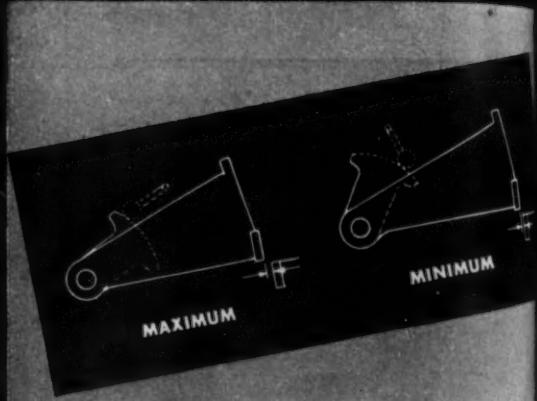
It came about this way:

Scientists for a quarter century had been trying to learn the cause of decay-resistant mottled enamel which discolored and disfigured teeth in many sections of the world. Mr. Churchill put the finger on the villain—fluorine in the water these people were drinking. This in itself was quite a discovery because fluorine had never before been considered a constituent of water.

Mr. Churchill reasoned that if fluorine in large amounts was responsible for the mottled effect, controlled amounts would prevent decay and at the same time not cause discoloration and mottling.



MICRO-SPEED acclaimed



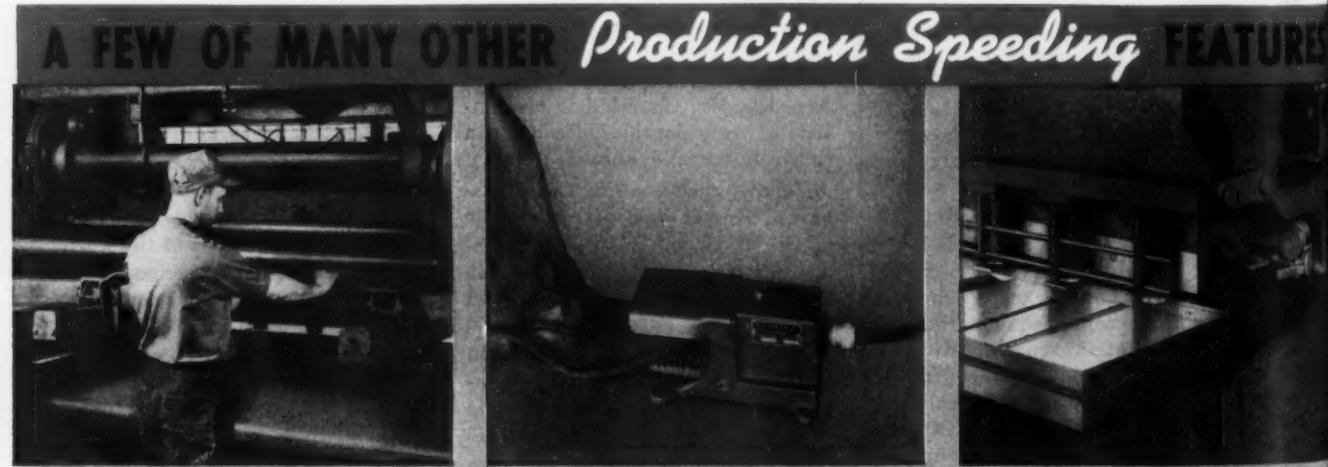
KNIVES REMAIN SHARPER LONGER BECAUSE OF MICRO-SPEED

From coast to coast Steelweld Shear users are acclaiming Steelweld's MICRO-SPEED knife adjustment. There's nothing like it available on any other shear—at any price. It's the greatest development in shear design made in decades.

As every shear user knows, there is a direct relation between the thickness of plate cut and the clearance between knives for most satisfactory results. But heretofore, because of tedious time-consuming work required to change knife clearance, most shear operators seldom adjusted the clearance unless there was a great variation in the thickness of plates being cut. Despite the advantages resulting, they could not afford the

time required to adjust the knives to proper clearance. Steelweld's MICRO-SPEED makes knife adjustment fast and easy. Merely turn a crank and watch a dial. That's all there is to it. In a jiffy the indicator is on the proper figure and the machine is ready to go. No bolts to loosen! No bed to move! No feeler gauges required! The large easily-read dial indicates the clearance between knives in thousandths of an inch and also shows the plate thickness that may be cut with any knife setting.

Because of simple MICRO-SPEED knife adjustment, every cut made on Steelweld Shears is the best possible cut—straight, smooth, accurate. And of importance, KNIVES REMAIN SHARPER, LONGER.



LIFT-UP BACK GAUGE

Lift-up back gauge can be raised out of way to allow long sheets to pass through by easy movement of horizontal bar. No time need be spent detaching or removing back gauge. Standard feature on $\frac{3}{8}$ inch capacity shears and larger.

FATIGUE-REDUCING FOOT CONTROL

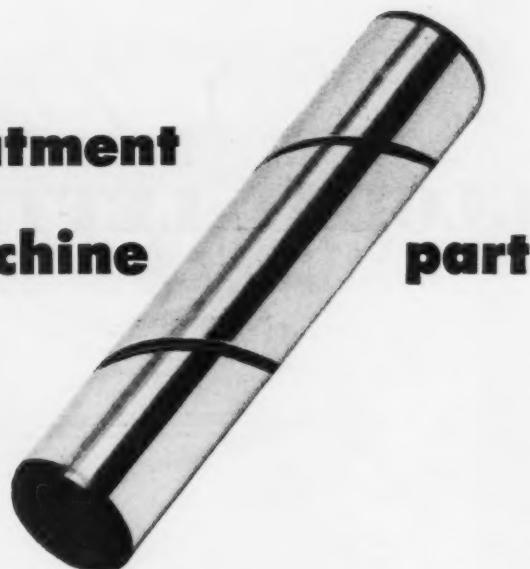
Convenient electric foot-switch operation is standard for all Steelweld Pivoted-Blade Shears. The switch can be moved around floor to wherever handiest. Eliminates tiresome leg lifting ordinarily required.

STEP-SAVING GAUGE ADJUSTMENT

Steelweld design eliminates need of many trips around machine to adjust hand-operated gauge at rear. Adjustment crank is quickly reached at right end near front. When required power-driven gauges can be furnished.

save expensive heat treatment of this vital washing machine

A REPORT FROM
REPUBLIC STEEL'S
alloy
METALLURGICAL FILES



When the chief metallurgist of a leading washing machine manufacturer found it necessary to improve a small but vitally important part of his company's product, he did something about it—

fast. He called for a Republic Alloy Steel Metallurgist to work with him in finding a better material which would not increase production costs.

The part—a segment gear stud—was being made of a standard carbon steel analysis and required cyanide hardening to meet necessary physical requirements. This type of hardening treatment was both slow and costly . . . rejects were numerous. After careful study, it was decided to change to one of Republic's carbon-corrected cold drawn alloy steel bar analyses.

THE RESULT: An ordinary controlled atmosphere furnace treatment replaced the expensive cyanide hardening operation . . . cost savings were substantial . . . rejection losses were effectively reduced.

Putting the right steel to work in the right place—*the full purpose of Republic's 3-Dimension Metallurgical Service*—has helped countless manufacturers in the never-ending drive toward higher quality at lower cost. Would you like it to do the same for you? Write today to:

REPUBLIC STEEL CORPORATION • Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO Export Department: Chrysler Building, New York 17, N.Y.



**Republic
ALLOY STEELS**

Pig Iron, Bolts and Nuts, Tubing

February 16, 1950

29

GLOBAL LETTER

REVIEW OF WORLD MARKETS



Dollar shortage still acute in Western Europe . . . Rise in French steel production . . . British factories increasing production of agricultural tractors.

London — Production and foreign trade have almost attained pre-war levels in Western Europe, according to the annual report of the European Marshall Council. In two years Western Europe has also almost halved the dollar deficit in its balance of payments, the report stated.

The dollar shortage, however, will continue to be an international problem for some time to come. At present the shortage is running at about \$4,000,000,000 a year and is estimated to be about \$2,250,000,000 annually when the Marshall Plan ends.

Rise in Living Standards Noted

Although living standards fall below pre-war levels by about 10 pct, the Marshall Plan has been successful in raising Western Europe's economic status for the most part, the report pointed out.

The pattern of world trade that existed in 1939 may never be restored. The Marshall Plan alone could not restore it, nor could it substitute a new pattern for it in the 4 years allotted to it. Demand for full employment and other social factors prevent any drastic

adjustments that might reduce the dollar shortage by lowering living standards.

U. S. Exports Double Pre-War

As a result, the report stated, a sure cure for the dollar shortage does not exist and, if one did, Europe alone could not apply it. The dollar shortage is an American as well as a European problem because world trade will be dominated "by the state of the United States balance of payments" for a long time to come.

With world trade at about the same level as pre-war, U. S. exports have doubled their pre-war volume. This is an unstable situation according to the Council's report. The U. S. has a huge excess of exports over imports, or an excess of European dollar imports over dollar exports.

Europe Must Reduce Imports

"Until U. S. trade is nearer to a balance there will be contraction in United States exports," the report says. Because of the dollar shortage the rest of the world must reduce its imports from the U. S. and at the same time try to earn more dollars to pay for them.

The Council's members are reluctant to forecast precisely how far these measures will reduce the dollar shortage in Western Europe. With favorable conditions they estimate the dollar deficit might be brought within manageable limits in the year following the Marshall Plan, 1952-1953.

Increased Steel Output Reported by French Industry

Paris — Production of refined and superrefined ferro-chrome steel has been estimated at 19,000 tons for 1951 and 24,000 tons for 1952, as compared with 10,000 tons in 1948. Extension of existing plants at Chede, in Alpen and Moutiers, in Savoy, as well as the erection of a new plant at Ardoise in the Gard District, are the reasons for the optimistic report. The Chede plant has already increased its capacity by 130 pct.

Cobalt Production Up

Cobalt production in France has reached sufficient capacity to cover the needs of the domestic market. This is due to the completion of plants started in 1946 for the roasting of cobalt ore imported from Morocco. One plant is located in the south of France at L'Estaque while the smelting plant is at Plombie-re-Saint Marcel in Savoy.

A French group has organized a new company to produce super-

Turn to Page 195

efficiency in Parcolacs for use as rust preventive finishes; others have been developed to add pleasant, non-marking, high appearance qualities. Your own requirements will dictate which Parcolac is best for your use.

Want improved paint adhesion
and rust resistance?

... BONDERITE



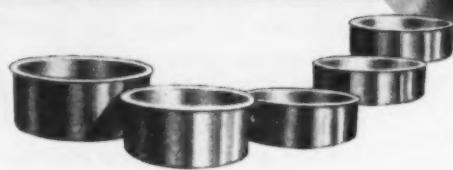
Most widely used of all Parker Products, Bonderite adds quality to many of the most attractive metal products manufactured today. It's under the paint on automobile bodies, fenders, and sheet metal. It is used by most refrigerator manufacturers, and on a great many of the finest domestic appliances. Wherever lasting fine appearance is important on a painted metal product, there is a place for Bonderite.

Bonderite converts the surface of metal to a non-metallic phosphate coating which is an excellent base for paint and, because of its nonmetallic character, an effective rust resistant.

Bonderite is fast and flexible, and can be used in immersion equipment and in automatic conveyor production lines. It is simple to control, producing positive and uniform results at low cost.

Want faster,
smoother draws?

... BONDERITE



The crystalline, nonmetallic Bonderite coating brings these benefits to the drawing bench: It holds lubricant, even under great pressure. It prevents metal to metal contact, reducing galling and scoring. It reduces wear on tools and dies, lengthening

the life of these expensive parts. It permits deeper, smoother, faster draws. *Cuts metal polishing costs.*

Want wear resistance
for friction parts?

... PARCO LUBRITE



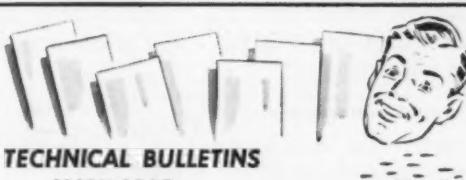
Faster, smoother break-in, greatly reduced danger of scoring and scuffing, and longer subsequent wear are the advantages Parco Lubrite brings to friction parts. The nonmetallic, crystalline coating holds oil under high operating pressures and temperatures. There's no metal-to-metal contact, and the parts "wear-in" quickly and smoothly.

Want better metal cleaning
and rust removal?

... PARCO Formulated CLEANERS

Parco Cleaners are formulated to clean better, go farther, with reduced concentrations of cleaner material required. These products do more than remove rust, soil, or grease; they also condition the metal for the next step in finishing.

Parco Cleaners include Solvent and Emulsion Types, Acid Types, Alkaline Types, and Water Conditioners.



TECHNICAL BULLETINS
AVAILABLE...

Full information on any of these Parker Products is yours on request. Write for technical bulletins on the Parker Products which can contribute to the solution of your problem and the success of your product.

Bonderite, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

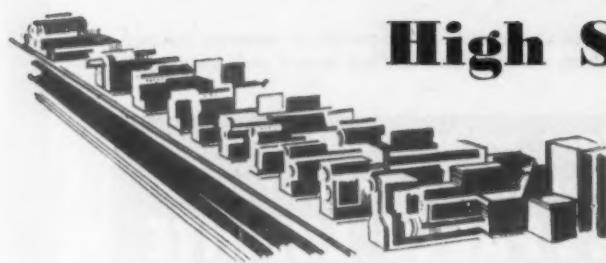
PARKER RUST PROOF COMPANY

2186 East Milwaukee Ave.
Detroit 11, Michigan

PARKER

BONDERITE—Corrosion Resistant Paint Base • PARCO COMPOUND—Rust Resistant • PARCO LUBRITE—Wear Resistant for Friction Surfaces

MACHINE TOOL High Spots



**Sales
Inquiries
and Production**



by

William A. Leary

Cleveland—Despite an assortment of uncertainties stemming from the coal strike, there is more optimism in the machine tool industry this week than there has been in a long time.

Reasons behind this apparent anomaly include: an accelerated tempo of new business in major sales sectors, notably Detroit. Also, the highly receptive attitude among machine tool users holds a lot of promise for the immediate future. Replacement, particularly, is getting a lot of attention today in companies where, a year ago, a machine tool salesman had a hard time getting an audience.

European Demand Continues

Directly or indirectly, much of the current business is coming from the automobile industry. The balance represents a widely diversified demand. On a company-by-company basis, order volume remains spotty, but some segments are getting orders in quantity.

Some of the industry's qualified observers see the revival in the machine tool business, which was predicted last summer, emerging from the present market pattern. There is a certain amount of evidence that the present upward trend will continue for several months.

**Machine tool business seen
continuing upward several
months . . . Reconditioned
machines high abroad.**

In the foreign markets, informed sources anticipate a continuing demand, particularly from Europe. According to some segments of the industry, current foreign business is about 10 pct under the volume anticipated. (Most of these segments, however, report that domestic business is about 10 pct better than they expected.) In the case of one company, ECA business accounted for only 28 pct of the total European business of 1949; the balance was provided by independent money. This should disprove the theory that ECA is the prime stimulant of all foreign business.

Western Germany is likely to be a factor in foreign business in the near future. In 1949, the Germans exported five times as many machine tools as they did in 1948, and are presently exporting about one-half their prewar volume. Prices are low.

Also going into the European markets are used U. S. machine tools in quantity, which will probably benefit domestic business eventually. Prices of these machines, according to European dealers, are pretty high. In some cases, reconditioned machines cost 80 pct as much as new machines. But the demand is there. Accord-

ing to informed trade sources, ratio of used machines to new machine exports is 3 to 1.

Reports circulating here this week that General Motors may have a new transmission ready for tooling in the near future may very well turn out to be true. It should be emphasized, however, that research technicians at GM are always quite a few steps ahead of the parade and that many important decisions remain to be taken before a tooling program gets under way. There are no available indications that tooling quotations for such a transmission have been requested.

Supplementing the present buying by Chrysler, Ford, GM Transmission Division, Studebaker and others, is a sizable amount of buying by small tool and die shops and automobile tool rooms. The pickup here in recent months by the smaller segments of the industry has been substantial, according to the best available information.

Instrument Guides Tools

In Schenectady, T. M. Berry, General Electric Co. engineer, revealed development of a contour following instrument that can guide a machine tool to cut out metal parts. Speaking before the Winter meeting of the American Institute of Electrical Engineers, Mr. Berry said GE engineers designed the instrument to simplify and speed up manufacture of irregularly shaped metal parts often difficult to make by hand-controlled machining methods.

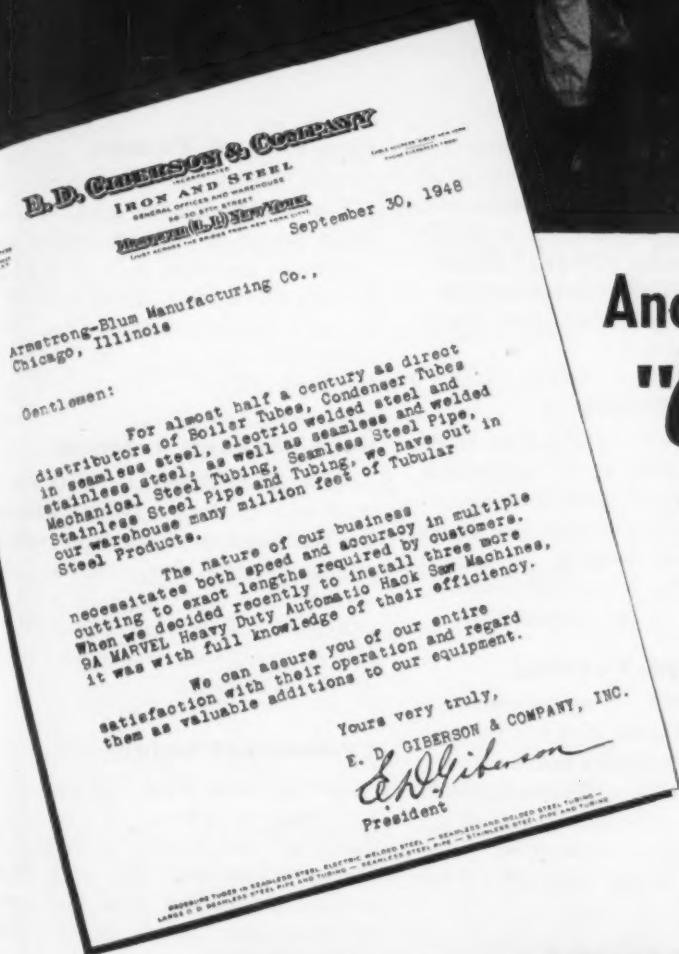
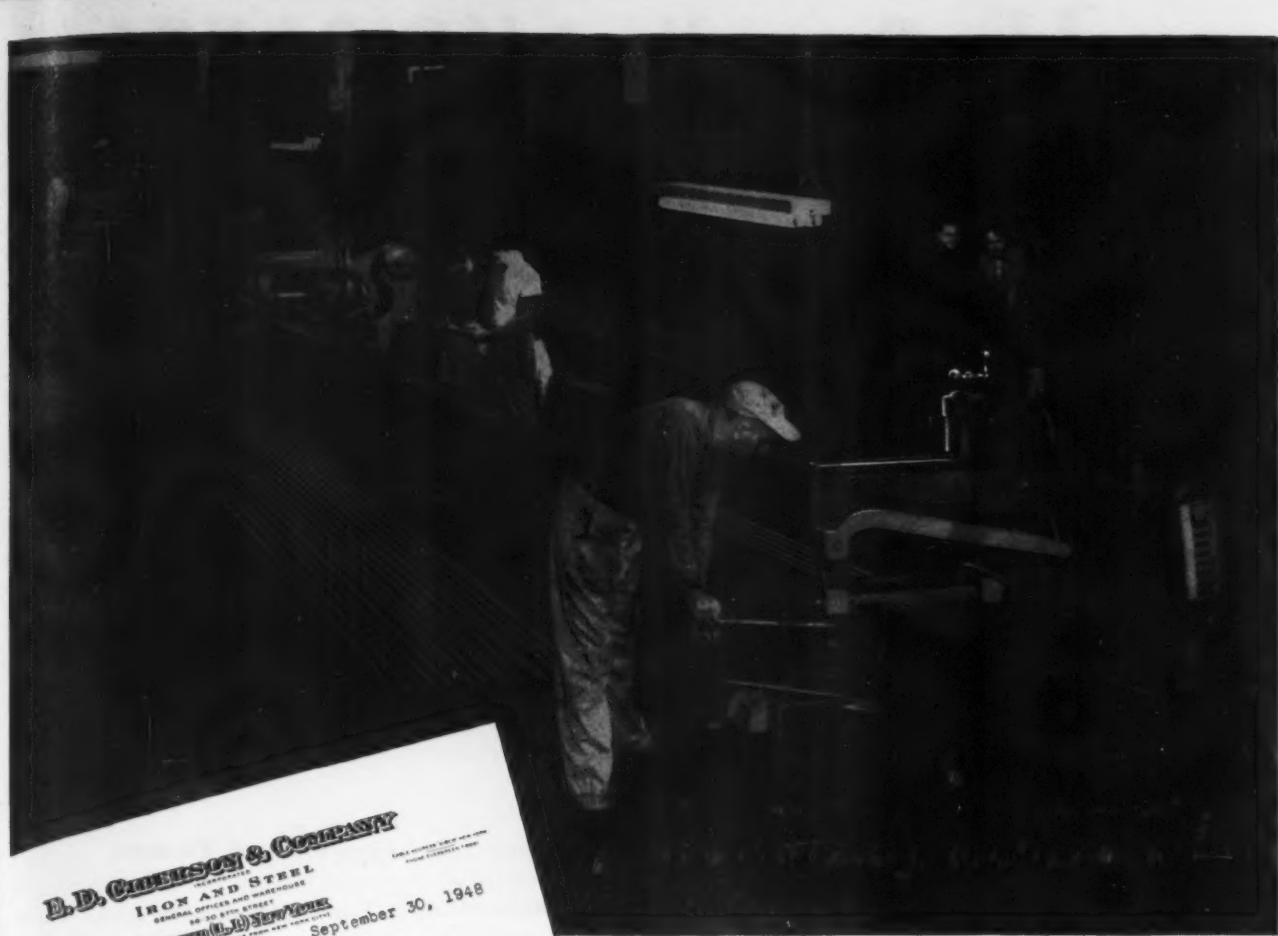
Heart of the system is an electric eye which scans the drawing of the part through a microscope. The eye moves along the lines of the drawing and is kept centered on them by means of an electronic control system. Movements of the eye and microscope are communicated electrically to the machine tool which is cutting the part so that the course taken by the following system is reproduced as a cross section of the part. Mr. Berry predicted that the instrument will prove particularly valuable in making master patterns for jet blades.

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Another Tubing Warehouse "Goes MARVEL"

Warehouses that are not equipped with proper sawing machines find that the cutting of steel tubing (especially the stainless types) is a difficult and costly job. But E. D. Giberson & Company, New York, have cut off millions of feet of all types and sizes of steel tubing to accurate lengths, economically and without difficulty, due to the fact that they have long been properly equipped with MARVEL SAWS. And because they have found MARVEL SAWS so trouble-free, so reliable, so economical to operate and so universally suited to all their cutting-off jobs, they have recently added this row of three new MARVEL No. 9A Automatic Hack Saws. With this additional equipment, they have expanded their facilities and can more promptly serve their fast-growing list of satisfied customers with steel tubing of all types and sizes, "cut to customer's specified lengths".

The local MARVEL Field Engineer will be glad to study your range of cutting-off work—whether it be in pipe, structural shapes, bars, or the toughest and largest alloy billets—and will then make recommendations on how you can improve your cutting-off operations to reduce costs and increase man-hour output.

Just write us on your letterhead: "Without cost or obligation on our part, send your local Field Engineer to look over our cutting-off operations".

Metal Cutting

MARVEL SAW'S

Better Machines-Better Blades

ARMSTRONG-BLUM MFG. COMPANY

"The Hack Saw People"

CHICAGO 39, U.S.A.



5700 BLOOMINGDALE AVENUE

February 16, 1950

FREE

USE POST CARD

PUBLICATIONS

Heat Exchangers

Young type R heat exchangers, designed to perform under a maximum operating pressure of 75 psi and temperatures up to 300°F, are described in an 8-p. catalog listing a wide range of stock sizes and models. *Young Radiator Co.* For more information, check No. 1 on the postcard.

Fastening Tool

The Drive-It tool uses a small powder charge to drive a hardened steel pin or stud into steel, concrete and other materials, eliminating drilling or previous preparation, as described in a 4-p. illustrated folder. *Powder Power Tool Corp.* For more information, check No. 2 on the postcard.

Ball Valves

Leak-proof ball valves for use in water, oil, gas, steam, chemical and fuel systems are shown in a 4-p. folder giving construction details and explaining operation. *Carpenter Mfg. Corp.* For more information, check No. 3 on the postcard.

Tension Washers

An 8-p. bulletin lists and illustrates a variety of bowed, wave, slotted, cupped and other special Spring Tension washers for loading and deflection applications. *M. D. Hubbard Spring Co.* For more information, check No. 4 on the postcard.

Steel Rings

Illustrated folder explains the manufacturing processes involved in the fabrication of stainless and

New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.

other steel rings, motor frame assemblies, and a wide variety of other ring shapes and weldments, and features the story of a 4-ring motor generator frame. *Dresser Mfg. Div., Dresser Industries, Inc.* For more information, check No. 5 on the postcard.

Portable Tables

Specifications for standard models of the Portalevator, a portable elevating table having a wide variety of uses in industry, are given in a new 4-p. bulletin. *Hamilton Tool Co.* For more information, check No. 6 on the postcard.

Boring and Turning

Specifications, construction and operating features of King vertical boring and turning machines are presented in a 16-p. illustrated catalog. *King Machine Tool Div., American Steel Foundries.* For more information, check No. 7 on the postcard.

Coal Dust Control

Complete freedom from coal dust for 1¢ a ton, and dustless ashes for another 1¢, is the story told in a new 4-p. folder entitled "Coal Dust Control." *Aquadyne Corp.* For more information, check No. 8 on the postcard.

Centrifugal Pumps

The line of Conseco centrifugal and piston pumps for use in mines, mills, power plants and marine applications are described in a 24-p. illustrated catalog. *Condenser Service and Engineering Co., Inc.* For more information, check No. 9 on the postcard.

Soot Blowing Systems

Automatic-sequential power-operated soot blowing systems featuring centralizing pushbutton control panels of wide flexibility are described and illustrated in a 16-p. bulletin. *Vulcan Soot Blower Corp.* For more information, check No. 10 on the postcard.

Cylindrical Grinder

Landis 12 in. Type CH universal hydraulic cylindrical grinders are described and illustrated with photographs and line cuts in a 26-p. catalog presenting this new precision grinder. *Landis Tool Co.* For more information, check No. 11 on the postcard.

Hole Punching Units

The universal range of applications and mounting methods to permit an unlimited number of

Turn to Page 156

If ABRASION is Your Problem...

look to NI-HARD for Your Answer

ONE OF THE HARDEST commercial products of the iron foundry is a nickel-chromium white cast iron trade-named "NI-HARD*".

HARDNESS RANGE

Its Brinell hardness ranges from 550 to 650 when sand cast, and 600 to 725 when chill cast.

This extreme hardness . . . at the moderate price of NI-HARD . . . provides abrasion resistance at lowest ultimate cost.

STRUCTURE

Unlike other cast irons . . . NI-HARD comprises a multitude of hard carbides firmly embedded in a matrix which is as hard as fully hardened steel. NI-HARD is unmachinable except in special cases. Finishing requirements are met by grinding or the use of cast-in-place machinable inserts.

PERFORMANCE

NI-HARD develops abrasion resistance two to three times better than that of unalloyed white iron. Therefore NI-HARD can economically replace white iron.

NI-HARD lasts one and one-half to two times as long as austenitic manganese or carbon steels, under conditions involving only moderate impact. Chill cast parts are stronger and more abrasion-resistant than comparable sand castings.

STRESS RELIEF

The strength and toughness of NI-HARD castings are increased fifty to eighty per cent, without loss in hardness or abrasion resistance, by a stress relieving treatment at 400-450°F. User experience has demonstrated the merit of specifying this treatment.

APPLICATIONS

Applications include: grinding balls, ball and rod mill liners, slurry pump parts, flotation impellers, piping, scoop lips, classifier shoes, roll heads, pulverizer rings, chutes and hopper liners, muller tires, plows, pug mill knives, clay augers. Also coke grizzly discs, crusher rolls, coal mine pumps, dredge pump impellers, liners, rings and sleeves. Also industrial food grinding burrs and attrition mill plates.

AVAILABILITY

Try NI-HARD wherever you encounter severe abrasion. See for yourself how its remarkable properties minimize replacements and repairs.

Authorized foundries throughout the country readily produce NI-HARD castings in all forms and shapes common to the iron and steel foundry.

INFORMATION AVAILABLE

Full information is yours for the asking. Write for the booklets, "Engineering Properties and Applications of NI-HARD", and, "Buyers Guide for NI-HARD Castings."

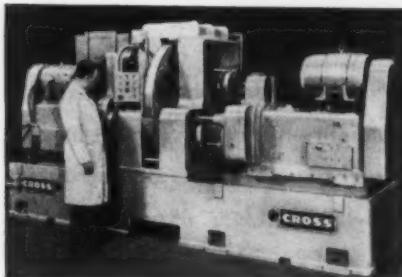
*Reg. U. S. Pat. Off.



THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET
NEW YORK 5, N.Y.

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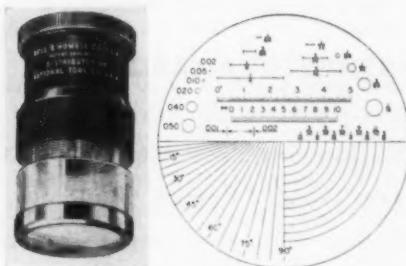
station three, 16 holes are chamfered; at station four, 15 holes are chamfered; at station five, 3 holes are reamed. The cycle of operation



is push button controlled. Flexibility for part design changes is provided by use of standard Cross sub-assemblies. *Cross Co.* For more information, check No. 30 on the postcard on p. 37.

Pocket Comparator

A pocket comparator for the inspection of small parts or small dimensions on large parts checks linear measurements, circles, angles, and radii. The instrument permits the user to compare through a magnifying lens, the part to be checked against a finely calibrated pattern or reticle. The lens is a triplet-design aplanatic type of great accuracy and has a magnification of approximately 7 to 1. The upper part of the reticle has lengths graduated in steps of



1/64, 1/32, 3/64, 1/32, 1/8, 3/16 and 1/4 in. There is a linear rule of 1/2 in. with 0.005-in. increments, and a 10 mm linear rule with 0.2 mm increments. Circles are shown graduated from 0.002 to 0.050 in. diam and from 1/64 to 1/16 in. diam. Angles between 0° and 90° in steps of 5° can be measured, and

radii from 1/16 to 3/8 in. *National Tool Co.* For more information, check No. 31 on the postcard on p. 37.

Honing Machine

Designed to hone any bore from 1 to 4 in. diam x 10 in. long, a heavy duty semi-production honing machine has all control of the movement of the hydraulically reciprocated head on the Uni-Control lever. The tool is inched into the bore, the rotation is started and

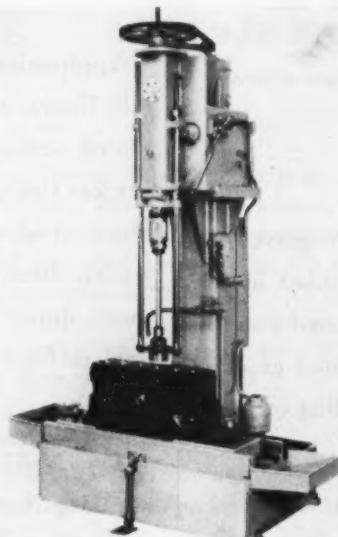
for high production performance under consistent heavy-duty usage. The cradles may be moved from press to press by one man and may be loaded to capacity without auxiliary equipment. Easy Load motor driven cradles are being made in two sizes. One handles coil stock



up to 36 in. OD and up to 10-in. width. The second handles coil stock up to 40 in. OD and 10-in. wide. Load capacity of the models is 800 and 2000 lb respectively. Rate of speed is 90 fpm. *Rowe Tool & Die Co.* For more information, check No. 33 on the postcard on p. 37.

Internal Forming Tool

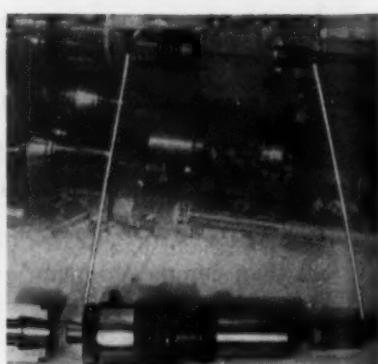
Used on fully automatic machines, an internal forming tool facilitates production operations on jobs formerly requiring secondary setup. The new tools are recommended for use in back counterboring, thread relieving, grind relieving, back chamfering, and ordinary recessing operations. Series



stopped, the reciprocation speed is regulated and the tool is withdrawn from the bore by the manipulation of this one lever. The tool is expanded by an adjusting sleeve, on the head, that does not rotate with the tool. Stock removal and size can be computed and controlled by a calibrated ratchet ring on this sleeve. The machine is particularly adaptable to the reconditioning of parts such as automotive cylinder bores and connecting rods. *Micromatic Hone Corp.* For more information, check No. 32 on the postcard on p. 37.

Coil Cradles

Designed to provide greater economy and increased efficiency in the use of coil stock with punch press operation, cradles have been proved



DB tools can be used in any position and can be interchanged between different machines. Model No. 1 1/2 tool has working range from 3/8 to 2 in., No. 2 tool, from 1 to 3

Turn to Page 160

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MESTA

MESTA Forgings

The illustration shows a forged steel rotor shaft for a turbine driven generator installation at Grand Coulee Dam. The shaft was manufactured complete, from raw materials to finished product, in the Mesta Shops.

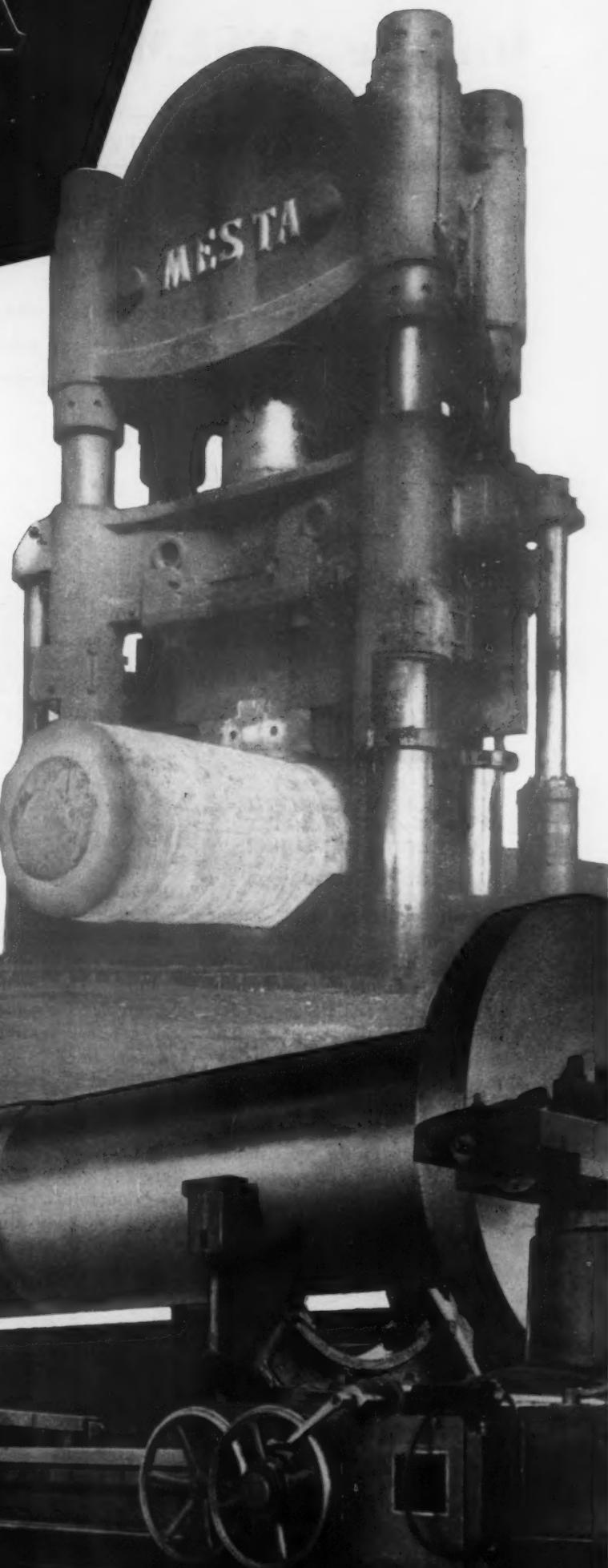
Mesta Forge Shops produce carbon and alloy steel forgings in all sizes required by industry, including crankshafts, marine parts, rolls, pinions, pressure vessels, pump blocks, table rollers, coupling halves, gears, spindles, and many others.

Write for descriptive forging literature.

DESIGNERS AND BUILDERS OF
COMPLETE STEEL PLANTS

MESTA MACHINE CO.

PITTSBURGH, PENNSYLVANIA



UNITED STATES BUREAU OF BUDGET

On the ASSEMBLY LINE

AUTOMOTIVE NEWS AND OPINIONS

**Kaisers place their bets in the 1950 auto sweepstakes . . .
1951 Kaiser and light car attract big crowds at Chicago
. . . Coal shortage hits Detroit . . . Ford moves operations**



by

Walter G. Patten

Detroit — Henry and Edgar Kaiser will be at the auto show in Chicago this week-end to observe first-hand the public's reaction to the 1951 Kaiser and Frazer models and the new low-priced car. The new Kaisers will be introduced by K-F dealers late in March, the small car about June 30.

This will be a big day for the Kaisers—probably the most important day since K-F got into volume production at Willow Run. Public acceptance of the new cars will largely determine whether a new and vigorous independent producer is to be a permanent addition to the intensely competitive auto race.

Those who have seen the new cars give Henry and Edgar Kaiser an excellent chance of scoring at least one bull's eye from the standpoint of public appeal. If the price

of the new Kaiser models is right, say the Detroit experts, and K-F is able to build up its dealer strength, the Willow Run producer has an excellent chance to make a go of it. Whatever may be in store for the Kaisers and K-F, it is generally agreed here that Edgar Kaiser is making a tremendous bid to make his father's hope for a permanent place in the auto world come true.

Will Make Fewer Frazers

During the coming year, the 1951 Kaiser will be the bread-and-butter K-F entry in the auto sweepstakes. Production of the Frazer will be continued but not in large volume. The small car will also be assembled for some months to come at a lesser volume than the 1951 Kaiser line.

The new cars have pleasing contours and a number of interesting new features. A new name has been coined to describe the increased vision of the new models—"Control Tower" vision. The engine has been zipped up to give 115 hp with high torque characteristics in the driving range. The body and frame are completely new. The car is just five ft high and the center of gravity is unusually low.

K-F will have the industry's first full-padded crash-absorbing instrument panel. Seats are new and

comfortable. As usual, K-F stylists have done an outstanding job on the interior trim.

The 1951 Kaisers are offered in 12 body types, including Special and DeLuxe four-door sedan, two-door sedan, club coupe, business coupe and two and four-door utility sedans. Each model has GM's Hydra-Matic drive or overdrive as optional equipment.

Automotive stylists will be interested in the "sweetheart curves"—in the roof at the top centers of the windshield and the rear windows—and in the "gull-wing" dips which simulate rear fender lines. There is a slight down-sweep to both the front and rear fenders. Another identifying characteristic of the new cars is the broad, protective chrome trim panel which extends at bumper level for the entire length of the car.

Windshield posts are the thinnest in the industry. K-F engineers claim they are tied in to the cowl and roof is such a way as to offer maximum strength and resistance to impact.

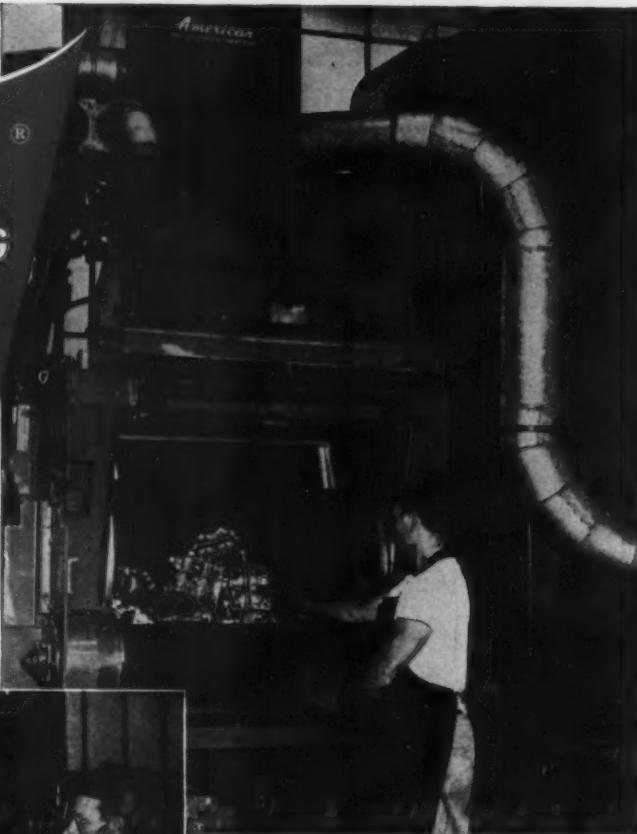
Entirely New Kaiser Frame

It is also claimed the new type mounting of the side glass, which is nearly flush with the exterior body panels, effectively curbs wind noise.

The frame of the Kaiser 1951 models is entirely new. Although

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IN LESS THAN ONE YEAR

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WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

February 16, 1950



1950 CADILLAC: Shown in the illustration is a Cadillac Series 61, five passenger sedan. The vertical strip at the front of the rear fenders replaces the familiar stone guard. Cadillac engineers claim substantial improvement in gasoline economy and improved performance of the Cadillac Hydramatic automatic transmission.

five in. longer than the previous frame, changes in design have made it possible to lighten the frame by 60 lb. The frame is of a box channel type.

The body is also changed substantially from a structural standpoint. Box steel roof sections give added stiffness to the top.

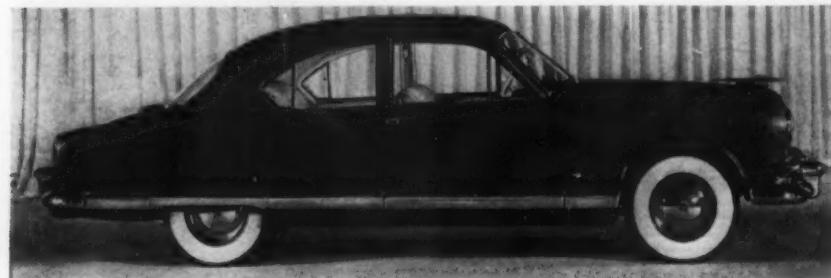
K-F engineers contend the new "jumbo" brakes give added life and efficiency. Center-point steering with "lock-socket" linkage is specified. Hardware has been redesigned, eliminating the push-button inner door releases. New type "freeze-proof" door locks are used.

K-F has a new "tuck-away" tire feature in which the spare tire is recessed out of sight under the floor of the luggage compartment.

Result of 7 Years Work

According to Henry Kaiser, the new low-priced car culminates seven years of experimental work in which more than 50 different light car models have been built. Engines used in experimental models have ranged from 10 to 100 hp.

1951 KAISER: This two-door sedan, one of the 21 new body styles comprising the 1951 Kaiser line has an entirely new body and frame. Important changes in the engine, now equipped with Hydra-Matic, provide additional torque in the driving range.



by four or six cylinder engines to be built by Willys-Overland. K-F is furnishing part of the tooling. The new engines are expected to give upwards from 30 to 35 miles per gal.

A theory held by all the big American car manufacturers—that a light car cannot succeed in the U. S. market—is about to be thoroughly tested.

Ford Moves to Monroe in April

Early in April Ford Motor Co. will begin moving operations from its Hamilton, Ohio, plant to a larger plant in Monroe, Mich., which was recently purchased from Kelsey-Hayes. Large scale operations will probably not begin until September.

Except for some new employees, Ford is offering jobs to its Hamilton employees in the Monroe plant. Workers who move to Monroe will get credit for their years of service with Ford.

Ford has indicated several times that the Hamilton plant is inadequate because of space limitations to meet the schedules contemplated by the company. The Hamilton facilities could not be expanded economically, Ford explained, to make the necessary number of wheels, coil springs and running boards called for in the Ford schedules.

GM Halts All Overtime Work

The coal shortage has hit Detroit. Last week General Motors announced that all Saturday work and overtime schedules in its assembly plants will be brought to a halt because of the national emergency in coal. C. E. Wilson, president of GM, said that overtime in all GM plants, both automotive and non-automotive, will be reduced.

The GM overtime plans were formulated to provide for spring building of car stocks in dealer hands. Cutting out overtime will spread available steel over a longer period of standard work-week schedules, Wilson said. The GM president explained that the demand for GM cars, household appliances and diesel locomotives continues to be very strong.

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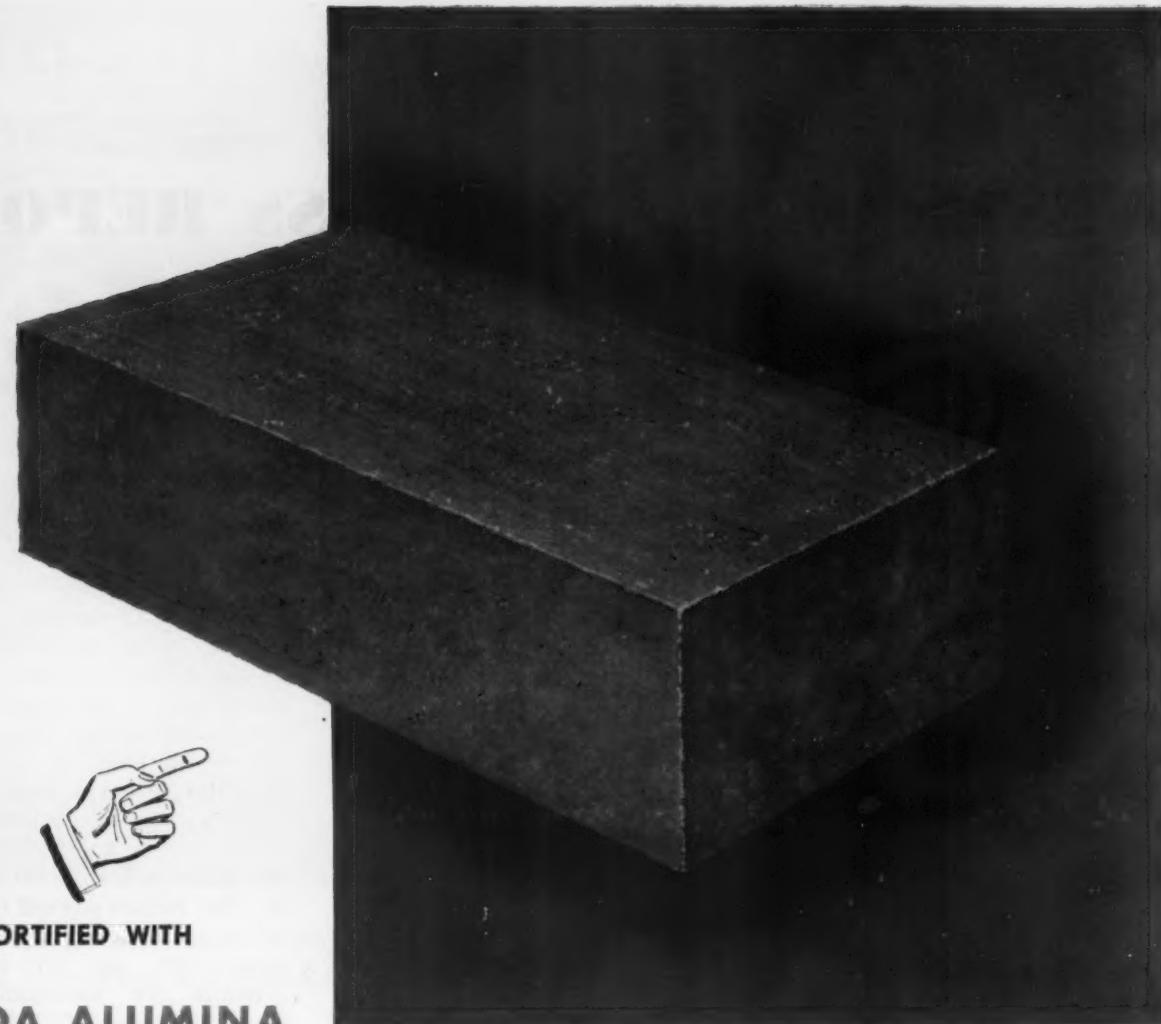
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maximum service qualities, the grade of ALCOA Alumina most suited to the job should be used.

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WEST COAST PROGRESS REPORT



Unemployment trend and heavy drains on insurance funds pose problems for industry . . . Los Angeles smog control board gives foundries more time.

San Francisco—Rising unemployment is a bitter pill which western industry and business is having to swallow.

Sugar-coating unemployment figures with "seasonal losses" and "heavy in-migration" fails to make the prospect any more pleasing.

Unquestionably, the migration westward has increased the labor force far more rapidly than industry or business can absorb it, and is probably accountable for a considerable portion of the unemployed. However a decline in all manufacturing employees in the state of California in December, 1949, to a level of approximately 703,000 from the December, 1948, figure of 727,000 can only be explained by layoffs or curtailments. The iron and steel industry in the state now has a labor force of approximately 61,000 whereas a year ago the figure was close to 67,000.

Latest California figures show that in January there were about 455,000 out of work which is 46,000 more than in December. About

Digest of Far West Industrial Activity



by

300,000 of these were drawing unemployment insurance.

Fears More Unemployment

The depletion of California's unemployment fund is a matter of concern to many industrialists here and recently the California Manufacturers Association, comprising about 600 members representing employers of approximately 80 pct of all manufacturing labor, pointed out that during the 13 yrs and 10 months since the inception of the unemployment fund, benefit payments have aggregated \$933,601,000 and of this total 23 pct was paid in the first 10 months of 1949 and 39 pct was paid in the last 22 months.

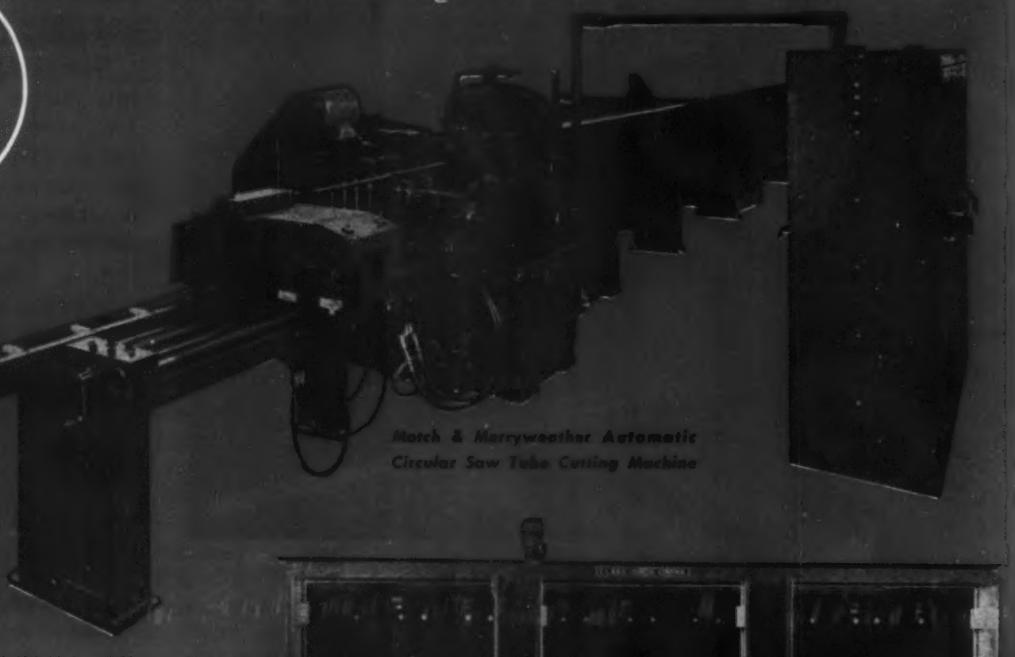
Considering the heavy drain on

the unemployment fund as contributing to higher prices and more unfavorable competitive positions with products produced in other states, William B. Tyler, president of CMA, said, "the employer stands the entire cost of unemployment insurance, and the tax on the gross payroll to keep the unemployment fund intact is becoming very burdensome. Wages in California are the highest in the nation which is at it should be. But hidden payroll costs cannot be ignored. When out of state competitors put on the price pressure we necessarily must meet their prices. This inevitably leads to economies. The boss can economize in many ways, even resorting to reducing the number of workers on the payroll. This fate clearly is in store for thousands of Californians unless the excessive drain on the state unemployment fund is stopped."

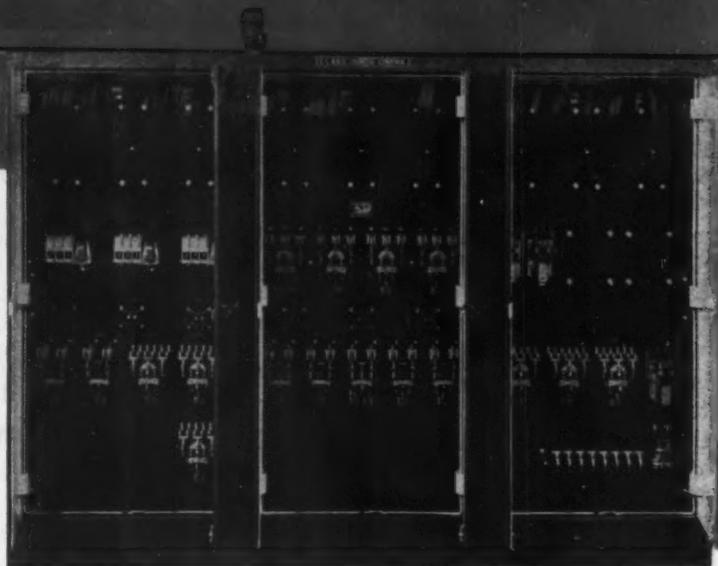
The association is strongly in support of unemployment insurance of regular employees, but the manufacturers point out that they cannot finance this program as a welfare arrangement for transients, for the summer part-time worker or for the "woman who retires to get married or have a baby."

A record high point of 94,000 unemployed was reported by the state of Oregon on Feb. 1 which is about 10,000 more than a year ago and only one month ago unemployment was reported as being only 69,000. Extremely cold weather which closed down logging and saw mill operations ac-

STEEL MILL AUTOMATIC CIRCULAR SAW uses CLARK CONTROLS



Motch & Merryweather Automatic Circular Saw Tube Cutting Machine



CLARK CONTROL PANEL for Motch & Merryweather Circular Saw

This Motch & Merryweather Automatic Circular Sawing machine—installed in a Mid-West steel plant—rapidly cuts square welded tubing into accurate lengths.

The loading, stock feed, cut-off to length, and ejection of finished pieces is automatic. The entire operation functions with CLARK ENGINEERED CONTROL, thus eliminating operator fatigue, and materially reducing production time.

This machine handles 24-foot stock lengths in multiple. The sawing area is 4 x 12 inches with cut off lengths up to 8 feet long. Five pieces of 2½ inch square tubing are cut, ready for shipping every 90 seconds.

The 7½ HP saw motor, 2 HP Hydraulic Pump motor, ¼ HP coolant motor, 7½ HP walking beam motor,

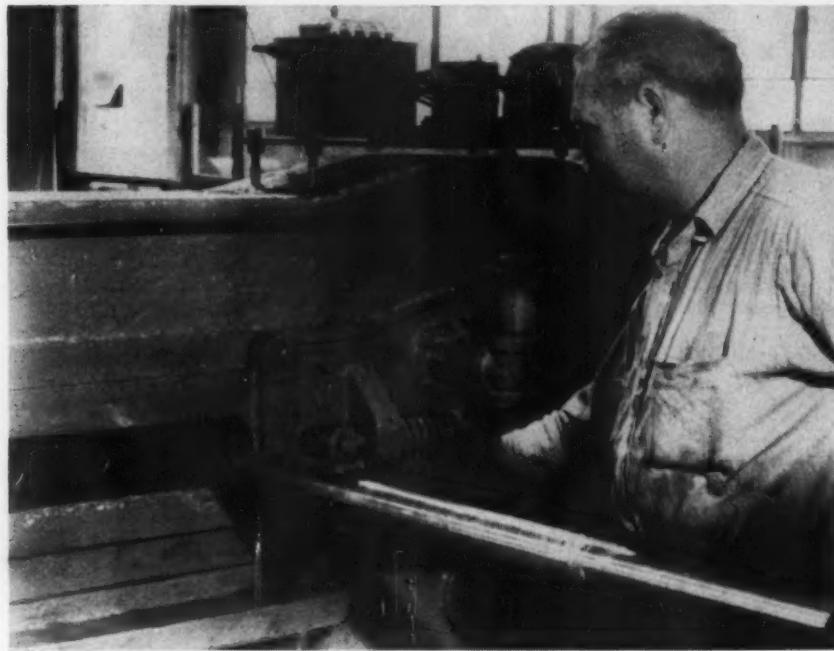
the 3 HP stock feed motor, and the 1 HP take-off motor are all controlled by CLARK HEAVY DUTY Bulletin 7700 and Bulletin 7400 contactors, and overload protection is supplied by Bulletin 7322 Thermal Overload Relays. All control apparatus is enclosed in neat floor mounted vault type cabinets.

Where heavy duty operation is required, there you'll find CLARK CONTROL.



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POINTING: Scene in plant of Pacific Coast Div. of Revere Copper and Brass, Inc., Los Angeles, Calif., worker is pointing tube prior to drawing.

counted for a large percentage of this unemployment.

The state of Washington likewise reports an upswing in unemployment with more than 95,800 claimants for jobless benefits reported last week which is an increase of 4000 in one week. This too is a record high for the state and in part is attributable to the extremely cold weather. It is estimated that approximately 9000 persons in Washington have used up their unemployment insurance rights for the rest of this fiscal year which ends in July. Jobless benefits amounted to \$1,730,459 last week.

While it would be difficult to find anyone willing to express public alarm at the increase in unemployment there is a considerable amount of study and planning under way by both industry and state officials on the Coast to stem the tide.

Employers Are Optimistic

If a survey by the California Manufacturers Association among its members is indicative there is a strong feeling of optimism prevailing about business prospects in general. This survey showed that 38 pct of the members ex-

pected to do about the same volume of business in the first quarter of this year as last; 32 pct expect to do 55 pct more business in the first quarter than in 1949 and 26 pct expect to do less this year than last.

L.A. Officials and Foundries Are Closer on Smoke Control

Los Angeles — Apparent harmony between officers of the Los Angeles County Air Pollution Board and the gray iron foundrymen of the area was indicated at a test hearing last week on a deadline set for the signing of contracts on smog control equipment.

The Herco Co. again provided the test case with the same pattern expected to be followed in like manner for the 60 other foundries of the area. The other hearings were scheduled for later.

The Herco case followed a January deadline given gray iron foundries to sign contracts for pollution control equipment or face the possibility of being refused a permit to operate. Although the board took the matter under advisement, it was ex-

pected that they would allow the deadline to drop without action and extend it until probably mid-May.

More Equipment Needed

New evidence was introduced into the hearings by Aubrey Grindle, vice president of Whiting Corp., who told of the efforts of his company to devise foundry equipment to meet the stiff requirements of the Los Angeles law.

Whiting had installed test equipment on the General Metals plant under a contract let before the law was changed to its present state. The Whiting equipment was reported by laboratories to meet the old standards but falls a little short of present requirements.

Considerable discussion was held regarding the Kennard and Drake closed cupola with no definite decision on its use. Many of the foundrymen indicated outside the hearing, however, that they believe additional equipment would be needed on the end of the closed cupola stack to make it meet the law.

Most now believe that the eventual solution to the problem will include secondary combustion and wet wash sprays.

Gordon Larson, Air Pollution control officer for Los Angeles County, testified before the hearing board that he had gone over the work of the foundries carefully with his staff, and they believed that the experimental work of the foundrymen was following the best possible lines.

A committee of spokesmen for the foundry industry had met with Mr. Larson on several previous occasions prior to the January deadline and explained the difficulties they were encountering.

Mr. Grindle indicated that his company would devote considerable time toward development of equipment to take the last fine particles out of the emissions from gray iron foundry operations.

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Along with better results at higher speeds, you get an extra bonus of SAFETY when you switch production jobs to Multipress.

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Preset and hydraulically controlled ram action makes Multipress safe and sure for women operators and untrained personnel. They get uniformly good results with less fatigue *and with full safety*.

Multipress is built in a full range of frame sizes, for bench and floor installations, in capacities from 1 to 35 tons. Controls, and attachments for almost any operating need. For faster, better, safer production, depend on MULTIPRESS.

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THE FEDERAL VIEW

THIS WEEK IN WASHINGTON

**Sen. Banking Committee may embarrass administration by
RFC investigation . . . Change in unions' tax exempt status
unlikely . . . CEA attempts to reduce group conflicts.**



by

Eugene J. Hardy

Washington—Don't be surprised if the Senate Banking Committee's investigation of the lending policies of the Reconstruction Finance Corporation turns out to be no more explosive than a defective Chinese firecracker.

Sen. Fulbright, D., Ark., has been demanding such an investigation ever since RFC advanced some \$44.4 million to the Kaiser-Frazer Corp., last fall. The failure of the Lustron Corp., to crack the mass housing market after being financed almost entirely by RFC was also a contributing factor. Congressional critics expressed the belief that the K-F loan amounted to equity financing, which was not intended by Congress.

The Arkansas Democrat had considerable support for a thorough study of the government's lending function looking toward possible realignment of policy objectives or even liquidation of the emergency-spawned RFC. This latter objective, while thought highly of in some quarters on Capitol Hill, doesn't have the chance of the proverbial snowball at the present time. The Administration is now embark-

ed on an election year small business pilgrimage in which RFC would play an important part by dispensing or guaranteeing loans to small business firms.

Lucas Opposes Probe

Mr. Lucas, a Fair Deal stalwart, was not too pleased about the possibility of a full-fledged probe of RFC during an election year. Thus far, he has done his best to make certain that the Administration will not be embarrassed by any deep digging into the operations of this agency.

He first blocked Senate action on Sen. Fulbright's resolution on the grounds that the language of the resolution which called for "full and complete inquiry into the operations of the Reconstruction Finance Corp., implied that something is wrong with RFC. This protest was a clear indication of Administration touchiness, for such language is not unusual in resolutions asking for an investigation of an agency, law, or most anything.

After Sen. Fulbright agreed to substitute the following for the above language—"a thorough study of the operations, etc., " Sen. Lucas withdrew his objection and the Sen-

ate approved the measure, as suggested by Sen. Fullbright.

The Senate Banking Committee was given \$50,000 to do the job and is to report by June 1. The job will undoubtedly be handled by a carefully picked subcommittee, but even so if it gets to the public hearing stage the Administration may still be in for a few embarrassing moments, despite the valiant efforts of Sen. Lucas.

Treasury Counsel Calls For Tax on Exempt Organizations

Washington observers are still trying to determine what caused an Administration spokesman to ask Congress to tax the unrelated business activities of labor unions at ordinary corporate rates. Treasury Counsel T. J. Lynch included labor unions in his statement to the House Ways and Means Committee in which he called for levying of taxes on a variety of exempt organizations.

Significantly, an administration which is desperately searching for new revenue still ignores one of the biggest probable sources of such revenue—the thousands of coopera-

Designed for

Continuous Operation



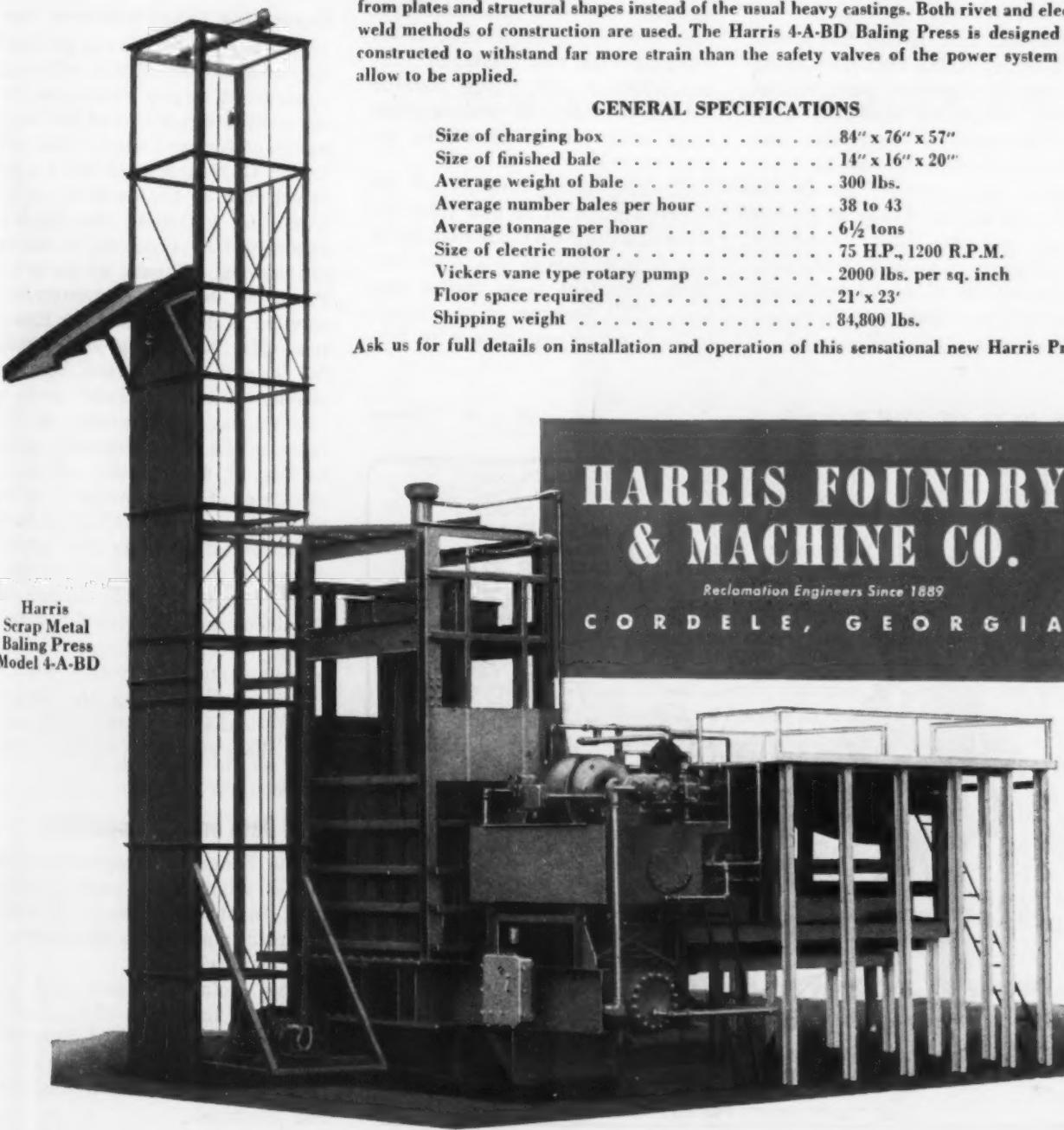
THE NEW HARRIS PRESS

BOTTOM DROP-OUT FOR BALES SPEEDS PRODUCTION—This revolutionary design is a great time saver and profit maker. While the compression chamber is baling, the charging chamber is receiving a new load. No bale is too large to come out of the new, speedy, bottom drop-out. This new Harris Press is of exceptionally sturdy construction from plates and structural shapes instead of the usual heavy castings. Both rivet and electric weld methods of construction are used. The Harris 4-A-BD Baling Press is designed and constructed to withstand far more strain than the safety valves of the power system will allow to be applied.

GENERAL SPECIFICATIONS

Size of charging box	84" x 76" x 57"
Size of finished bale	14" x 16" x 20"
Average weight of bale	300 lbs.
Average number bales per hour	38 to 43
Average tonnage per hour	6½ tons
Size of electric motor	75 H.P., 1200 R.P.M.
Vickers vane type rotary pump	2000 lbs. per sq. inch
Floor space required	21' x 23'
Shipping weight	84,800 lbs.

Ask us for full details on installation and operation of this sensational new Harris Press.



tives operating all types of businesses in every corner of the country. It is estimated that if these cooperative organizations were taxed just as are the business organizations with which they compete, the Treasury would gain additional revenue amounting to upwards of \$600 million.

Unions to Retain Status

While President Truman asked for taxation of the business activities of charitable and educational organizations in his recent tax message he did not call for similar treatment of labor unions and cooperatives. Mr. Lynch has added labor unions to the list. He pointed out that the Treasury Dept. recommended "that the unrelated business activities of charitable and educational organizations, business leagues, labor unions and social groups be subject to tax at the ordinary corporate rates." Congress will probably go along with the general objectives of this proposal, but it doesn't seem likely that the status of labor unions will be disturbed.

CEA Chairman Seeks Peace Between Conflicting Groups

Further indications that Administration spokesmen, who have been generally regarded as disciples of left-wing economic philosophy, are trying to convince Congress and the business community that they are really a bunch of all right guys has come from Leon H. Keyserling, Acting Chairman of the Council of Economic Advisers. In a brief appearance before the House Appropriations Committee, Mr. Keyserling tried to impress committee members with his statement that, "the most important change in our work since last year relates to . . . our relations with groups working in the economy, as distinguished from groups working within the government."

Mr. Keyserling further told the congressmen that he now rates the Council's work with business, labor and farm groups as one of the two most important tasks facing that body. This program is an attempt to encourage these groups to fur-

ther their own studies and efforts toward more stability and growth in our economy and toward a reduction of conflicts among them. He reported that the Council had experienced "some success in that line this past year." Instead of having just a general meeting with these groups, Mr. Keyserling says that they are looking toward the development of "more specific joint studies." He also tried to impress the committee by citing the names of several big industrialists who reportedly are working closely with the Council.

Keyserling Takes Political View

Mr. Keyserling, who is generally regarded as an extreme left-wing opportunist largely responsible for the conflict which caused the resignation of former Council Chairman Edwin G. Nourse, still takes a political view of the Council's objectives. In his view the Council, established by Congress to render professional economic advice to the President, should be completely subservient to the wishes of the Executive. Mr. Keyserling states that, "so far as I am concerned, being an adviser to the President under a statute, my construction of the function of a man of integrity would be that if he furnishes advice to the Chief of State, whom he is set up to advise, and the Chief of State fundamentally rejects that advice, a man of integrity would resign."

In other words, even though the President may be ignorant of economic matters, and even if the best economic minds privately tell the President he is wrong, Mr. Keyserling feels that the Council must support the President publicly or resign.

Give Data on ECA Importers

The Economic Cooperation Administration has issued a directory, in three volumes, of ECA-financed importers in the Marshall plan countries.

One includes names and addresses of importers of machinery and vehicles, another of importers of raw materials, and the third, fuel, miscellaneous and unclassified products.

THE BULL OF THE WOODS

By J. R. Williams



Metal Drawing

DEMANDS CORRECT LUBRICATION

By E. L. H. BASTIAN
Staff Engineer,
Shell Oil Co., New York



DEEP drawing of sheet is practically always facilitated by drawing lubricants. While die design, the selection of material, and annealing practice in press drawing are important, industry engineers agree that die lubrication and better lubricants can account for better production of deep drawn metal products.

The stimuli provided in recent years by industry demands for both better production and improved economies in press drawing have ac-

celerated the work of investigators in developing better lubricants and improving applications.

In considering what press drawing lubricants are, what they should be, and how they are used for best results, it is desirable to look first at the fundamental purposes for which they are used and how they function. Dependent upon mechanical factors of design and operation, press drawing lubricants are required to serve the following purposes or functions: (1) To cool the

Lubricants in ferrous and nonferrous metal press drawing must cool and lubricate the dies and the work. Specific lubricants for press drawing aluminum, magnesium, copper, brass, and carbon and stainless steels are indicated, along with the advantages and limitations of each lubricant for the individual applications.

dies and work, in cold drawing, for better size tolerances on finished pieces and better die life. (2) To lubricate dies and workpiece under conditions of high unit pressures and sometimes of relatively high rubbing speeds. (3) To coat or cushion the die face against the work surface being formed, thus minimizing the natural tendency under drawing conditions for an actual metal to metal contact.

These are basic purposes applicable in practically all drawing operations. For press drawing they require modification and explanation. For example, while cooling, as a usual function of a lubricant, is applicable in the case of high production cold drawing through a progressive die machine, it probably plays little part in many large, slow speed, multiple action press jobs. In the case of deep drawing of magnesium, always done hot at blank and die temperatures of 450° to 650°F, the cooling function of the lubricant obviously is undesirable.

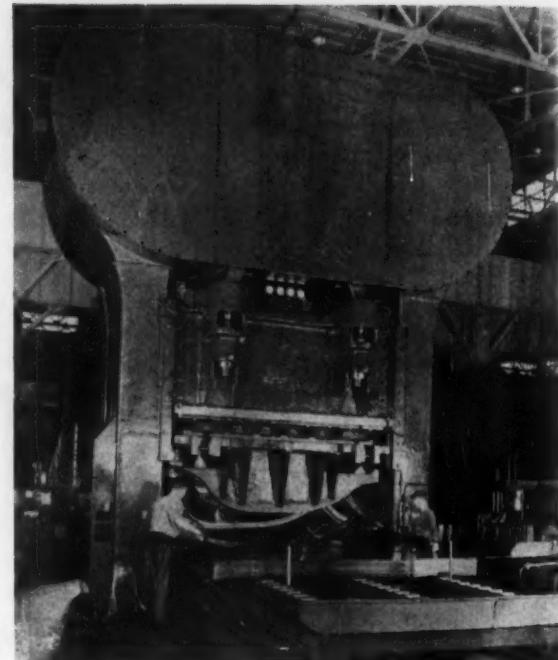
The function of drawing lubrication, as it pertains to press drawing, is quite different than ordinary bearing lubrication. In the latter case, unit pressures are low and allow formation of a fluid or thick film of lubricant between the metal surfaces. This type of lubrication, wherein the adjacent metal surfaces are completely separated by supporting fluid film, is generally known as *hydrodynamic or thick film lubrication*. Bearing pressures may be on the order of only a few hundred psi.

In contrast, drawing metal requires imposition of stress loads somewhere between the elastic limit and the ultimate strength of the metal itself. Dependent upon the operation and the nature of workmetal, these unit loads may be a hundred thousand psi or more. Under such pressure, fluid or hydrodynamic lubrication, as such, is impossible. It is replaced by what is known as *boundary lubrication*, generally characterized by friction coefficients higher than those for fluid lubrication but lower than would apply for dry friction, wherein no lubricant is used.

Boundary Lubrication

Boundary lubrication, dependent upon its relative effectiveness (usually associated with the type and thickness of surface film), may and often does allow actual metal to metal contact between surfaces. The mechanism by which it may be obtained depends upon the lubricant used. In general, physical and chemical attachment of the lubricant film to the metal seems to occur by processes of adsorption and adhesion.

The function of a drawing lubricant to prevent or minimize welding and pick-up of the softer workmetal onto the die face is possibly its most



Lubrication in press drawing of metals serves three functions, cooling dies and work, lubricating dies and work, and cushioning the die face against the work being formed. Tops of automobiles are being drawn in the operation shown here. Photo courtesy E. W. Bliss Co.

important purpose. The degree of a lubricant's ability in this direction frequently reflects its general utility as a good boundary lubricant. Again, by both physical and chemical means at the metal interface, various types of lubricants successfully and practically prevent the welding, pick-up and other metallic adhesion of work on dies that would otherwise ruin both.

There are three general groups of substances used in the press drawing: (1) Aqueous solutions or emulsions, (2) oil-base lubricants, and (3) non-metallic solid or semi-plastic substances usually used to precoat work blanks. Soft metallic coatings can be utilized in press drawing work, but they are more commonly encountered in the bar, rod, tube and wire drawing fields. Table I shows the types of lubricants that comprise the three general classifications indicated.

Of the three groups of lubricants, the aqueous fluids offer the best possibilities for cooling. Such fluids are often used in high production press work on small pieces, punch drawn from strip.

Various soap powders and chips are used to make up soap solutions. Sodium and potassium soaps are both used. Sometimes the latter as a soft soap compound containing 5 to 10 pct fatty material is used instead of the dry soap. This compound is similar to those used in drawing fine copper wire. The usual soap-fat emulsions employed as press drawing lubricants and coolants are made up by mixing a paste-type drawing compound with water.

Typical compounds are sodium soaps, fats such

as degras, tallow, rapeseed oil and lard, and some water. For both ferrous and nonferrous press drawing work the sodium soaps are commonly used, probably because of the adherent coatings obtained. An average composition for the usual paste compound is equal parts of the three major components, soap, fat and water. In some commercial products, however, the fatty oil content may be as high as 50 pct.

Soluble Oil Mixtures

Another emulsion used is prepared by mixing soluble oil with water. The soluble oil is usually a mineral oil to which emulsifiers, such as sulfonates and resin soaps, have been added to permit emulsification. The compounded oil may contain fatty oil or fatty acid compounds, and the resultant emulsion may be like those prepared from paste compounds. The difference is in the unsaponifiable mineral oil content of the soluble oil emulsion. Such emulsions are often lower in cost than those made up from paste compounds.

Pigmented emulsion slurries contain a pigment filler to improve the ability of the emulsion to prevent metal to metal contact during drawing. Pigments used are principally chalk, talc, clay carbonates, mica, and sometimes such materials as zinc oxide, white lead, graphite, and resins, either natural or synthetic. The latter, particularly in compounds made to be water miscible, and, hence, relatively easily cleaned from the drawn pieces, are receiving an increasing amount of attention. Frequently, pigmented compounds and emulsions of older types are difficult to clean off by ordinary alkaline wash methods. The pigmented emulsions are effective for heavy, deep drawn, particularly on ferrous work.

Where exceptionally good adherence of the slurry or emulsion is desired on work blanks and dies, invert type emulsions are sometimes used. Such emulsions are the water-in-oil variety, as opposed to the more conventional oil-in-water emulsion that usually contain much more water than the invert emulsion. The latter, by virtue of their adherent character, are more difficult to clean from the finished work. Invert emulsions can sometimes be made from ordinary soluble oils by adding only a small proportion of water, say equal parts of each rather than the usual three or four parts of water ordinarily added to the neat oil.

Chemically Active Compounds

Chemically active compounds, including sulfurized and even chlorinated oils and fats, are sometimes used in a drawing compound or emulsion to obtain the chemical surface reactions useful to prevent metal to metal contact and welding in heavy draws. Effective cleaning procedures must be established to prevent detrimental effects of sulfur on the metal during annealing. Such chemical compounds are used only on ferrous work, rarely on nonferrous, and practi-

cally never on copper alloys in view of the staining effects of sulfur.

Straight mineral oils of light viscosities are used for light stamping and shallow draws of both ferrous and nonferrous metals, particularly for thin strip stock.

Fatty oils, such as lard oil, rapeseed oil, cotton seed oil, and others are used similarly for copper, brass and other nonferrous metal stamping and drawing. Frequently the use of mineral fatty oil blends are as effective in drawing as the neat fatty oil. The economic advantages of such blends over straight fatty oils are well known.

The use of soaps in addition to fatty oils in a compounded mineral drawing oil is frequently advantageous. Soluble oils containing a fatty oil are often used neat for nonferrous drawing, particularly of aluminum. Such oils, being readily emulsified, are easily cleaned from the drawn piece either by hot water (140°F), a warm dilute (2 pct concentration) soluble emulsion wash, or by milk alkaline cleaning solutions.

Emulsions are sometimes used for cleaning instead of more effective alkaline solutions, particularly for steel parts, if some temporary rust protection is desired on the work following drawing.

Neat Drawing Oils

For heavy draws on high physical metals or those prone to work harden, quite chemically active, neat drawing oils are recommended. Such oils usually have a mineral oil base, and are compounded with sulfurized fatty oils, sulfo-chlorinated fats, phosphorous compounds, soaps and waxes. The mineral oil itself may be sulfurized to increase the extent of anti-welding characteristics of the drawing fluid. These oils are commonly used on steel blanks but rarely on nonferrous work because of the staining character of nonferrous metals.

TABLE I

TYPES OF LUBRICANTS

Used in Press Drawing Metal

- I. Aqueous Fluids
 - (1) Soap solutions
 - (2) Soap-fat emulsions
 - (3) Soluble oil emulsions
 - (4) Soluble-fatty oil emulsions
 - (5) Pigmented emulsion slurries
 - (6) Chemically compounded emulsions
- II. Oils and Oil-Type Fluids
 - (1) Straight mineral oils
 - (2) Fatty oils
 - (3) Compounded mineral oils containing:
 - (a) Soaps or other emulsifiers
 - (b) Fatty, fatty oils, or fatty acids
 - (c) Chemically active compounds such as sulfur, chlorine, phosphorus, etc.
- III. Solids, Semi-Plastics and Precoats
 - (1) Dry soap films
 - (2) Wax coatings
 - (3) Phosphate coatings
 - (4) Dry solid lubricants, such as:
 - (a) Graphite
 - (b) Molybdenum-disulfide
 - (c) Other mineral solids

The effects of active sulfur to form low shear sulfide and oxide films on the metal during drawing have been generally established. This action to improve lubrication by the mechanism of E.P. (extreme pressure) lubrication, and to prevent actual metal welding and pick-up of the softer work metal on die surfaces is well known.

Chlorinated compounds act similarly to sulfur compounds. Active chlorine is released at lower spot temperatures than sulfur and appears to bridge the gap between the boundary lubrication effects of simple polar compounds, like the fatty acids, and the extreme pressure lubrication attributed to active sulfur compounds. In the use of chlorinated oils and compounds their adherent character on metal surfaces is often noted.

While effective for drawing such materials as stainless steel, the chemically active oils are invariably difficult to clean from the drawn work except with special solvents. Solvent degreasing, using trichlorethylene liquid or vapor, ordinarily is required to satisfactorily remove such oils.

Dry Soap Lubrication

Dry soap films are used in press drawing both ferrous and nonferrous work. A hot soda soap solution, sometimes incorporating borax, is used to precoat the blanks by dipping. Solution temperature should be high, on the order of 180° to 200°F. Air or oven drying blanks leaves a thin, hard, clean coating effective in drawing. Where cooling during drawing is not required, such coatings may be superior to emulsions or compound solutions otherwise used. There is no mess of compound at the press, the pieces are easy to handle, do not pick up extraneous dirt, and are easily and completely cleaned after drawing by hot water or mild alkaline cleaning solutions.

Wax or wax-fatty coatings are effective drawing lubricants for light and medium heavy draw jobs, particularly nonferrous. Such compounds, usually solid at room temperature, may be applied either by a hot dip application (120° to 150°F bulk temperature of lubricant), a spray of hot material, or by the use of a solvent vehicle. The last is a cold application and necessitates flashing off the vehicle to leave the dry coating. The usual safety precautions must be taken in such applications to avoid fires and explosion.

The use of phosphate coatings on steel blanks to facilitate drawing is common practice. The nonmetallic phosphate coating is obtained by either spray or dip application of a hot (150° to 185°F) phosphate salts and acid solution to the previously cleaned metal. This coating provides protection against metal to metal contact in drawing and serves as a sponge-like base coat

to hold soap-fat or oil lubricants applied before drawing. The process is effective in drawing difficult work and has been extended in use to nonferrous work such as aluminum. It is also applicable to zinc-coated steel blanks.

Graphite has been used in applications where the high work or ambient temperatures or other application reasons render unfeasible the use of the aqueous oil or other solid lubricants. The inertness of graphite to high temperatures, its ability to adhere tenaciously to metal surfaces and carry heavy unit loads, its friction reducing properties under boundary pressure conditions as occasioned by metal drawing are well known. The flat plate-like structure of graphite and its propensity toward orientation on the metal surface to allow ready cleavage and slip under shear probably account for its observed practical usefulness.

It is used in several fashions, either as the low ash flake type or the amorphous form used dry or in a vehicle. The latter may be an aqueous emulsion or slurry, an oil, or in some cases a volatile vehicle such as naphtha. In hot drawing, such as employed for magnesium, the vehicle is flashed off, leaving the graphite on the surface. Colloidal dispersions of extremely fine graphite particles are used in some lubrication applications.

For drawing, where single use application is the rule, the cheaper flake dispersions are usually adequate. Graphite, however, is used only where absolutely necessary in drawing, because it is difficult to remove.

Another dry, solid substance showing exceptional friction reducing properties under high pressures is molybdenum-disulfide powder, which looks like graphite. Its ability to prevent galling and welding between metal interfaces at high pressures, rubbing speeds, and spot temperature has been commercially demonstrated.

Flake Lubricants

Its properties are explained by the laminar structure of the material composed to molybdenum plates faced by sulfur, the latter accounting for its tenacious adherence to the metal surface. Under shear, the flat plate-like structure of the substance allows ready shear cleavage through the sulfur bonds, thus accounting for its low friction under pressure in such shear. The latter properties were demonstrated by Boyd and Robertson.¹

Like graphite, this substance is difficult to clean from metal surfaces, and offers some problems in this respect. The presence of the sulfur on the metal surface during annealing also might prove detrimental.

Heavy emulsions or slurries made up of pigmented, soap-fat paste compounds, diluted with water, are commonly used for deep drawing car-

TABLE II

LUBRICANT RECOMMENDATIONS

Press Drawing Lubricant Recommendations, Type Numbers Identified at Bottom of Table

Drawing Operation	Metal to be Drawn							
	Carbon Steel	Alloy Steel	Stainless Steel	Aluminum	Magnesium	Copper, Brass	Bronze	Zinc
Blanking and Stamping.....	3	2	11	9	....	1	2	1
	7	9	12	10	....	7	9	....
Shallow Press Draw.....	2	5	11	2	....	2	2	2
	4	6	12	10	....	9	9	12
Deep Press Draw (Cold).....	5	5	11	2	....	2	5	2
	14	14	13	8	....	8	8	12
Deep Press Draw (Hot).....	....	....	....	15	15	15	15	....
Stretch-Forming (Cold).....	....	....	....	5	....	....	....	....
	....	....	....	10	....	....	....	....
Stretch-Forming (Cold with Rubber Pad).....	....	....	....	1	....	....	....	....
	....	....	....	12	....	....	....	....
Stretch-Forming (Hot).....	....	....	....	15	15	....	....	....
Heavy Cupping.....	5	5	5	5	....	5	5	....
	11	11	11	15	....	....	....	....

Types of Press Drawing Lubricants:

- 1—Soap solution.
- 2—Soap-fat compound emulsion.
- 3—Soluble oil emulsion.
- 4—Soluble-fatty oil emulsion.
- 5—Pigmented soap-fat emulsion.

- 6—Chemically active emulsion.
- 7—Medium viscosity mineral oil.
- 8—Straight fatty oil such as lard.
- 9—Medium viscosity mineral-fatty oil.
- 10—Straight soluble oil, neat.

- 11—Sulf-chlorinated fatty-mineral oil.
- 12—Dry soap or dried soap coating.
- 13—Waxy base coating (may be chemically compounded).
- 14—Phosphate coating.
- 15—Graphite (in vehicle).

bon and low alloy steel blanks. From one to three parts of water per part of compound is usual practice. The lubricant may be hand applied by wiper, swab, or brush to the blanks before drawing, or it may be mechanically wiped or spray applied to the work. Dies are hand swabbed with the lubricant.

This practice is usually adequate for deep drawing operations, although lubrication can be further facilitated by the use of phosphate coatings applied to the sheets or strip before the lubricant. The phosphate coating acts as a tenacious surface protection and as a base coat sponge, so to speak, for the wet lubricant. Table II shows recommended lubricants for drawing specific metals.

Newer compounds, employing water miscible resins to replace the pigment filler, provide similar protective cushioning during drawing and are easily cleaned off. In the latter respect they are comparable to the nonpigmented soap-fat slurries for shallow draws on carbon steel. The nonpigmented compound emulsions, for such draws, can be used in dilutions of from one to ten parts of water per part of paste compound.

Circulation Problems

Where circulation of the emulsion to the press can be arranged, the aqueous lubricant is better for cooling and lubrication. Pigmented compounds are not usually used in circulatory systems because of the tendency of the pigment to settle out and clog up piping and other restricted openings. However, resin compounds can be

recirculated the same as the nonpigmented emulsions.

Dried on soap coatings and waxy coatings are advantageous in drawing carbon steel.

Fatty oils and mineral-fatty blends, sometimes containing as little as 5 or 10 pct fatty oil, are used in shallow draws, stamping, and blanking of light gage steel strip. The oil is either drip-applied to the incoming strip or wiper-applied by automatic devices. Steel strip and sheets can be perforated using mineral-fatty oils. The compounding often used is lard oil, sperm, rapeseed, lanolin, or fish oils. The typical viscosity of such blends is about S.S.U. 300 at 100°F.

Drawing Stainless Steel

While many of the same lubricants used for carbon steel are applicable for shallow drawing stainless sheet, heavier draws require special lubricants. Stainless steel tends to work harden and to pick-up on forming dies.

For ordinary press work, soap coatings, pigmented compound emulsions, and fatty mineral oil blends are used. For deep drawing, best results are with chemically active compounded oils and waxes. While in some commercial forms these lubricants are sufficiently fluid to be wiped on or swab-applied manually, many of them are semiplastic or solid at room temperature. The latter must be heated to 130° to 150°F for application by swab or spray. Such lubricants may contain some fats and soaps, but they are primarily dependent upon chemically active con-

stituents for their successful performance.

Sulfur, phosphorous, and chlorine, principally the latter, are introduced by suitable compounds. The use of chlorinated oils and waxes and other fluids in this connection is becoming increasingly recognized. Lubricants of this type are difficult to remove after drawing, requiring trichlorethylene solvent degreasing.

However, this cleaning problem is no deterrent in plants equipped with solvent degreasing units and compares favorably with cleaning methods necessary for dry solid nonmetallic or soft metallic coatings, otherwise demanded in deep drawing of stainless steel.

Forming Nonferrous Alloys

Ordinary brasses, copper, and zinc alloys lend themselves to press drawing operations involving stamping, perforating and shallow draws. Emulsions and oils are the two principal groups of lubricants used. Emulsions may be made up from soap chips, soluble oils, or ordinary soap-fat paste compounds of the nonpigmented variety. Soap or soap-fat concentrations of about 15 to 20 pct are usually adequate. This means using a mixture of four or five parts of water to one part of lubricant as received in the plant.

Application may be by hand swab, automatic strip wiper, spray or circulation over the die set in the press. The last method provides optimum cooling and is desirable in high speed punch operation on strip where facilities permit.

For deep draws and cupping on heavy stock, $\frac{1}{4}$ in. or thicker, and high strength alloys such as some bronzes, the use of a pigmented compound in heavy concentration (30 pct compound in water) may be necessary. If circulation of the lubricant is used, the pigment content of the neat compound to minimize settling out, should not exceed about 10 pct. If precoating is by swab, spray, or dip application, pigment content of the compound may be as high as 30 pct. This compound should be mixed with from one to three parts of water. Hence, the pigment concentration in the mixed lubricant may be from 7 to 15 pct, and the soap-fat concentration about 20 to 30 pct.

In the interest of easier cleaning, pigment should be held as low as drawing requirements will permit. Dry precoatings on stock are always more effective as a drawing lubricant than wet coatings unless the latter are obtained by circulation at the press. In such case, excellent cooling of the die set and work aids in the all around function of the lubricant.

Mineral and fatty oils, principally lard oil, are used in press drawing of copper, brass, bronzes, and zinc. Frequently a blend of mineral oil containing about 20 to 30 pct lard, sperm,

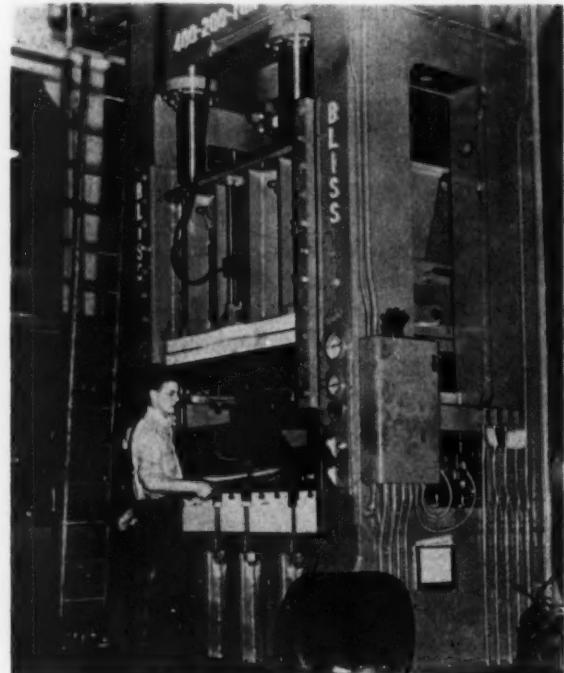
degras or other fatty oil is as satisfactory as the straight fatty oil in lubrication, and is lower in cost.

Relatively low free-fatty acid oils should be used on copper or brass to minimize formation of copper soaps that show up on the metal surface as green stains. Similarly, sulfur or chlorine in the base stock oil should be low and inactive to avoid stains on copper. Well refined mineral oils of commercial quality are usually satisfactory since such small sulfur contents as present from 0.10 to 0.50 pct, are firmly combined in the hydrocarbon structure and are inactive at operating temperatures encountered.

Soap and compound emulsions used on zinc should be as neutral as possible. Too alkaline an emulsion (pH above 8 or 9, for example) may cause whitish stains on zinc, caused by formation of salts on the surface. Neutral mineral oils or mineral-fatty oil blends are for this reason often used on zinc, as well as on copper and brass strip.

Emulsions, oils, and solid nonmetallic lubricants are all used satisfactorily in aluminum press drawing. The choice of lubricant depends upon conditions. At ordinary temperatures, aluminum alloys are susceptible to surface stains from water or aqueous fluids. These are caused by minerals contained in the water forming inorganic metallic salts in the otherwise colorless oxide coating on all exposed aluminum surfaces. It is this thin inert oxide film that accounts for the well known resistance of aluminum to corrosion and other chemical change.

However, when water or water solutions remain on the surface for some time, white stain-



In drawing steel, as shown here, a variety of lubricants can be used. Some of these are shown in Table II. Photo courtesy of E. W. Bliss Co.

ing salts are formed. They can be removed by mechanical abrasion or by commercial etching solutions. Either method removes the oxide film containing the staining salts.

Purer aluminum, the 2S and 3S grades, are less likely to stain than the alloys such as 24S or 52S, containing other metals, such as copper and magnesium. Hence, clad sheets are not readily affected.

With this as preface it may be noted that many press drawing operations on aluminum are lubricated by water solutions or emulsions. The most satisfactory of such emulsions are high in free fatty acid, 3 to 5 pct, which because of the polar characteristics of such acids, probably aid considerably in wetting the metal surface and in minimizing stains from more alkaline sources. The neat compounds or oils used to make up such emulsions contain soaps, free fats, coupling agents of various types, alcohols, and water. The free fatty acid of the neat lubricant as received in the plant may be as high as 10 to 20 pct.

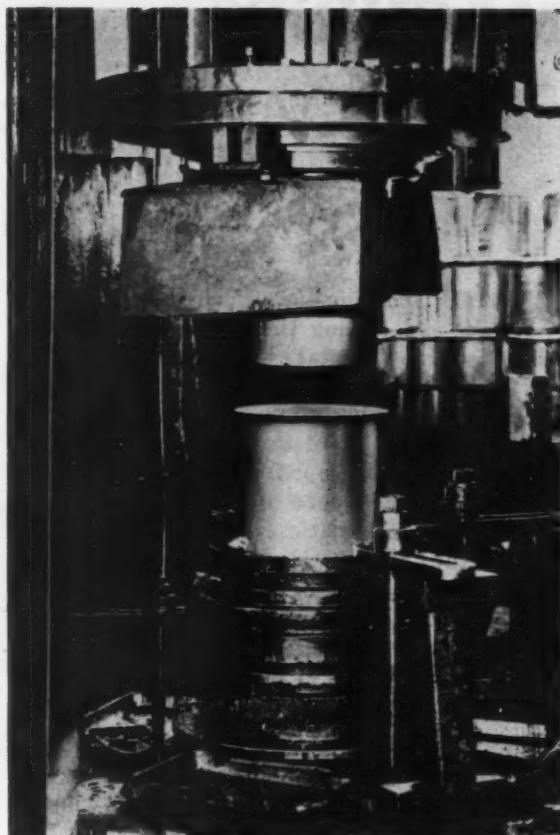
Neat oils, containing soaps, fatty oils and acids, and other additive constituents in a mineral oil base, are used for deep drawing aluminum and aluminum alloys. Fatty oils, such as lard oil and degras, diluted with kerosene or some other fluid vehicle have been used in press drawing as well as machining and other forming of aluminum sheets and stock.

In cold stretch-forming of aluminum, either emulsion or oil type lubricants are used. A heavy emulsion made from a pigmented compound is used to provide adequate cushioning and allow necessary sliding of the sheet over the die during forming. Ordinary calcium base cup grease or heavy compounded mineral oil has also been used. The latter is usually a bright or steam refined stock, S.S.U. 150 to 200 at 210°F, to which lard or some other fatty oil has been added. Table II shows specific recommendations of lubricants for drawing various metals.

In some installations, nonmetallic dies, such as plastic, may be used in stretch-forming. In such cases, no lubricant may be required because of the low friction characteristics between the plastic and aluminum. A rubber pad between the die face and the sheet may also be used. The rubber stretches and moves with both surfaces to provide necessary cushioning and prevent pick-up and other surface mars.

The use of dry soap or of a soft (potassium) soap evenly applied on the work blank is satisfactory in rubber pad work over dies. The soap should be relatively neutral to prevent any attack, either acidic or alkaline, on the rubber. Mineral oil should not ordinarily be used with a rubber pad as it may cause the rubber to swell and deteriorate. Application of the soap may be by predip in a hot soap-water solution, by dusting on blank surfaces, or by spraying.

As mentioned earlier in this article, magne-



This is the final draw in forming a 10-gal stainless steel stockpot. Because of work-hardening properties of stainless, special lubricants are required. For deep draws, chemically active compounded oils and waxes are frequently used. Photo courtesy of Armco Steel Corp.

sium blanks are always press drawn at an elevated temperature, usually between 450° and 650°F. At lower temperatures the metal is too brittle for proper shaping and will fracture. As with most metals, higher temperatures increase the ductility for drawing. The temperature used for work metal and dies is dependent upon the particular alloy being drawn.

A graphite dispersion applied to the work sheet and dies is the usually employed lubricant. Either flake graphite or finely divided colloidal graphite is used in a volatile vehicle same as in hot drawing of aluminum.

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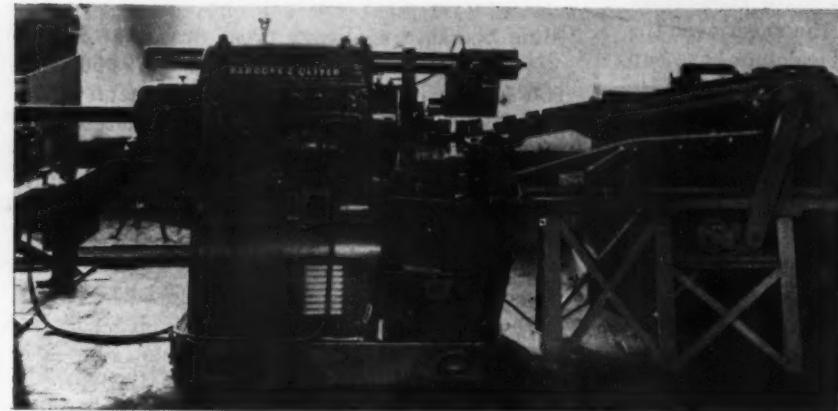
MACHINES LOADED and UNLOADED AUTOMATICALLY

WITH machining speeds constantly increasing, and cutting time becoming less and less a factor in the total cycle time, the handling of material into and out of machine tools becomes an increasingly important factor from a cost standpoint. Bardons & Oliver Co., Cleveland, recently developed an automatic loader and unloader to be used in conjunction with its hydraelectric automatic cutoff machine in the manufacture of pipe couplings. The loader end of the unit shown in fig. 1, picks up pipe stock and drops it onto a track in line with the stock feed through the machine.

By an arrangement of switches, rolls raise the pipe and move it forward into the machine for cutting to coupling lengths. A limit switch at the forward end of the loader is actuated when the pipe length leaves the loader, and causes the loader to drop another length of pipe on the rolls.

Speed of production of couplings is dependent upon speed of machining, both first and second operations, rather than on the loading and un-

loading. The track is powered and is adjustable in width to take pipe sizes from $\frac{1}{2}$ to 3 in. OD. When the coupling blanks reach the top of the inclined track, they feed by gravity to the second operation machine which, in the case shown



loading mechanisms. Eight 1.5 in. diam; six to seven 2 in. diam; and $12\frac{1}{4}$ in. diam couplings per min can be cut to length and threaded on the setup shown.

As the coupling is cut off and the end chamfered, it automatically moves forward out of the machine onto a track for delivery to the second operation. This causes a switch mechanism to feed pipe stock forward for the next coupling blank. Consequently, speed of production is also dependent upon the second operation. As shown in fig. 2, the coupling lengths travel up an inclined track to the second operation ma-

FIG. 1—Pipe stock is racked on this loader and feeds automatically into the Bardons & Oliver cutoff machine, and then into the second operation machine. Automatic controls start the second length of pipe through as the first releases a limit switch.

FIG. 2—As the pipe is cut to coupling length, the loader takes these couplings to the automatic in the background for chamfering. Pipe and couplings are loaded and unloaded from the machines automatically.

in fig. 2 is a Hill Acme single spindle automatic chamfering machine that chamfers the inside.

Normally, the capacity of the Bardons & Oliver cutoff and chamfering unit is slightly greater than the capacity of the threading equipment. This assures an uninterrupted supply of coupling blanks to the chamfering machine.

By means of this device, one operator can handle the entire line, the job becoming one of keeping a supply of pipe on the loading rack and making certain that tools in the machine are performing satisfactorily.

Self Regulating Solution SPEEDS CHROMIUM PLATING



By WILLIAM CZYGAN

Assistant Editor,
THE IRON AGE

Increases of 30 to 50 pct in cathode efficiency, permitting shorter plating time or thicker deposits in the same plating times, are reported by shops using Unichrome SRHS solution. The bath is automatically self-regulating, eliminating the need for chemical analysis. Other features include better covering power and less sensitivity to current interruptions.

MORE than a year of operation in a number of plant and jobbing shop pilot installations indicates that a new chromium plating solution introduced recently is a significant improvement over the conventional baths in use since 1924. The solution, called Unichrome Self Regulating High Speed bath, is made up and maintained with a single salt. The only regular solution maintenance required is the addition of compound to adjust concentration of the solution to the desired Baume.

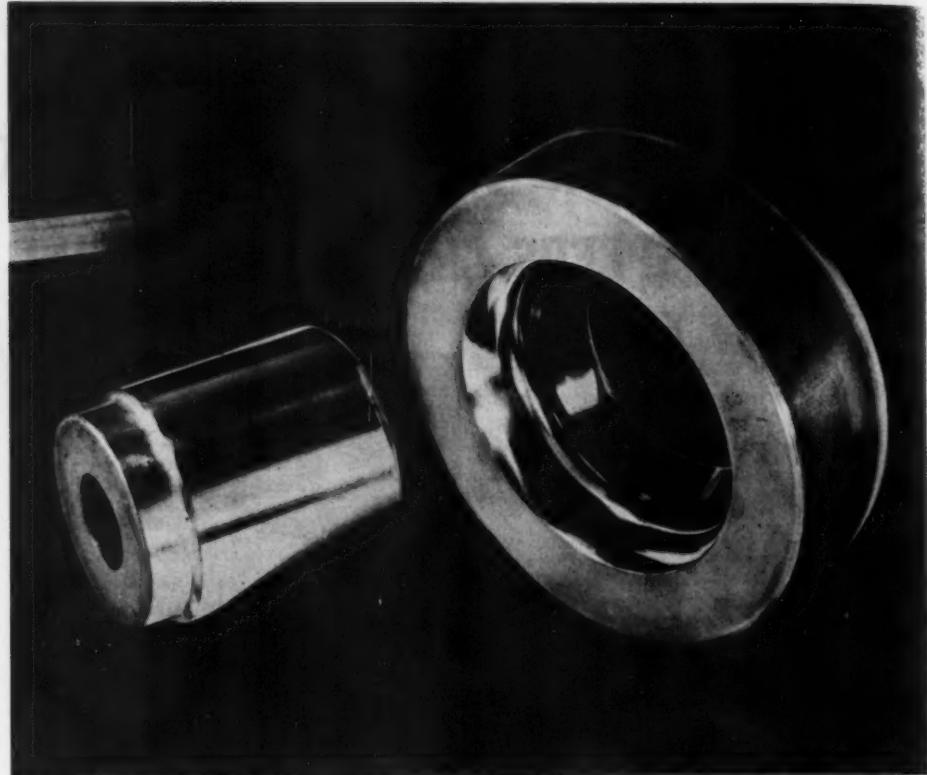
The acid catalyst radical concentration is automatically self regulating, keeping the solution in constant correct plating balance and eliminating the necessity for chemical analysis to maintain optimum plating conditions. Claims of higher cathode efficiency, better covering power, a wider bright plate range and less sensitivity to current interruptions are borne out by results obtained in several installations using the material. Unichrome SRHS compound is a product of United Chromium, Inc., New York.

A tank was operated for a year at Accurate Electroplating, Inc., Philadelphia, without any adjustment of bath constituents. Krometal, Inc., Philadelphia, operated a tank for four months at from 31°Be down to 20°Be, finally stabilizing at 26°Be, and no adjustments were necessary throughout the range.

Higher cathode efficiencies, ranging from a measured 30 pct to as much as 50 pct over those of solutions formerly used, are reported by Accurate Electroplating and Philadelphia Rustproof Co. For example, comparison tests show that in plating at 1 or 2 amp per sq in. at 110°F in a 31°Be Unichrome bath, cathode efficiencies were 16.8 pct, or 50 pct greater than the 10.7 efficiency of a conventional solution of the same concentration under identical conditions.

On this basis, plating in the SRHS bath requires about one-third less time. Thicker deposits may therefore be obtained in the same plating time used for ordinary baths, which is

FIG. 1—Dies and plugs, mandrels, gages, bushings and many other parts are being plated 30 to 50 pct faster in the SRHS solution.



Self Regulating Solution

Continued

particularly advantageous in hard chromium plating, such as on the die and plug shown in Fig. 1. The higher cathode efficiencies are reflected in lower power costs.

Other comparison tests were conducted by Hamilton Mfg. Corp., Columbus, Ind., where the solution was used in an 1850 gal semiautomatic chromium plating tank. Plating racks used ranged from 2 to 9 sq ft in area, averaging about 3.5 sq ft, and the plating load was usually adjusted to average 32 sq ft. Minimum plating time was 2 min. Plating conditions at which a normal load of work could be satisfactorily covered during the breaking-in period of the bath are given in Table I.

TABLE I
PLATING CONDITIONS OBSERVED

Conditions at which a normal load of work could be satisfactorily covered during breaking-in period of bath

Temperature, °F	Amp	V
118.....	5700	7+
115.....	5700	7+
115.....	3600	6+
105.....	3300	5½

The bath was operated for a full day of three shifts, after which it was noted that rejects on the tubular furniture parts were substantially reduced under the amount that an identical conventional solution line was producing. Operat-

ing temperatures dropped to 105°F in the SRHS bath as compared to the 120°F of the other solution. Current density for the same load requirements was approximately 5000 amp in the ordinary bath, while only 3600 amp were required in the new solution. Coverage and throwing power on similar items were generally increased.

Rejects caused by rainbowing are minimized because the bath shows little or no tendency to produce rainbow plate at the parting line of the chromium when plating over nickel. Another common cause of rejects is the gray chromium produced when plating over passive nickel. The new bath has considerable activating action on bright nickel, thus practically eliminating gray chromium resulting from this cause.

The bright plate range of Unichrome SRHS is wide enough to allow a substantial spread in current density without the danger of burning in high density areas. Using an automatic plating machine, Krometal, Inc., plates pieces of considerable variation in size and shape without any adjustment of current density. The wide bright plate range also permits good coverage at low densities, which is a useful feature to companies that plate a variety of irregularly-shaped pieces in production runs.

The lock parts shown in Fig. 2 presented several problems at Schlage Lock Co., San Francisco. The greatest improvement in plating ease was found in plating the lock strike. With the old solution, it was virtually impossible to plate

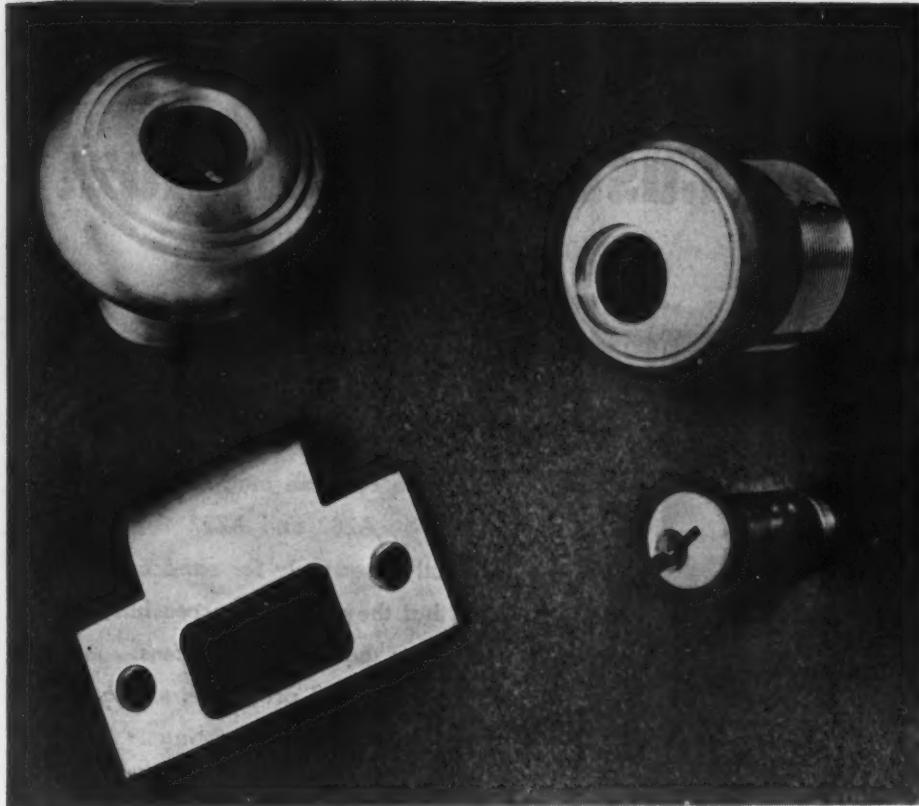


FIG. 2—Several operations in production plating of lock parts such as those shown here were eliminated through use of the new plating bath.

them in an automatic chrome plating machine because of excessive shading on the low current density areas, but they are being plated successfully with the new solution. This is true, however, when the cathode contacts are clean. After a slight buildup on these contacts (that is, after about 8 hr of production) cleaning is required. In the case of plating knobs, full coverage has not yet been obtained of the keyhole in the open knob or the backs of cylinder or wrought knobs.

The solution has been found by Schlage to be sensitive to slight temperature changes. The best operating temperature found by Schlage is 87°F, and if the solution temperature varies as much as 2°, results are adverse. Consequently, because of this low operating temperature, bright current density range is lowered.

Some difficulty has been encountered with sludging of the anode, but it is believed that this problem can be eliminated by the use of tin-lead anodes instead of present antimonial-lead anodes. The solution has been found by Schlage to be somewhat sensitive to drag-in of sulphates, and the majority of troubles with the solution has been the result of this fact.

Despite these shortcomings, the solution appears to have considerable potential, and results can be obtained if proper conditions are found. Greater cathode efficiencies are evident; rainbowing or gray chromium deposits, because of passive nickel, have not been experienced; and chromium plate can be plated over without producing any dark, gray or irregular deposits.

Uniformity of thickness was demonstrated at

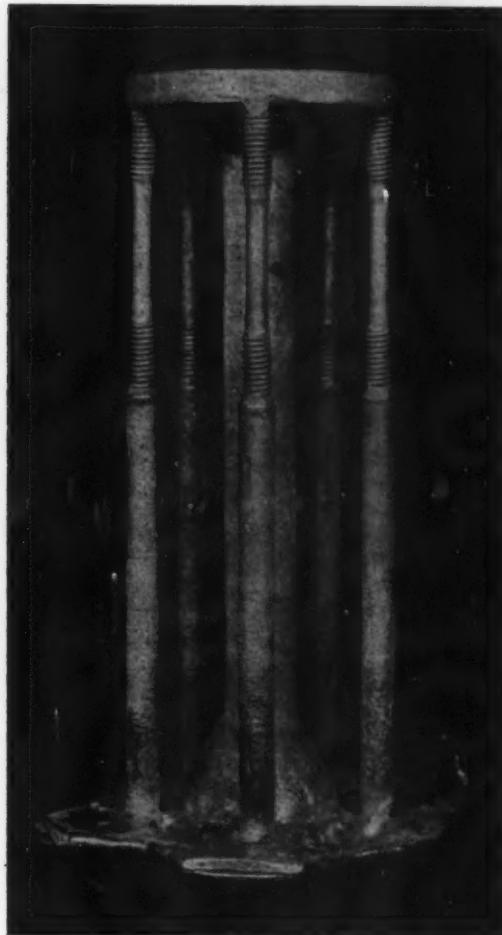
Philadelphia Rustproof by plating round rods without any special anode adaptation or racking, and consistently maintaining roundness within 0.0002 in.

Accidental current interruptions do not produce the usual iridescent brown or gray chromium plate that requires buffing, stripping and repliting, or lengthy activating procedures before redepositing chromium on chromium. The solution does not require uninterrupted completion of plating, an important fact to smaller shops not operating two or three shifts. The piece may be removed from the bath and started again the following day until the desired thickness of plate is obtained without stripping or preliminary preparation.

Physical and chemical properties of the deposit are the same as for deposits produced in a conventional solution, with the possible exception that hardnesses are generally higher. Hardnesses as high as 1250 Bhn have been reported under best conditions.

Standard chromium plating equipment is generally satisfactory for use with the new solution. A steel tank with a suitable plastic lining is preferable, although lead alloy and ceramic lined tanks may be used. Thorough rinsing prior to chromium plating is recommended, and facilities for this should be provided. Tin-lead alloy anodes are recommended. The usual type of generator or rectifier is satisfactory, but because of the high current efficiency of the bath, the total generator or rectifier capacity probably can be less than used with a standard bath.

Investment Casting Magnesium



How the magnesium investment-cast specimens were cast.

DURING recent months considerable interest has been shown in the application of magnesium-base alloys to the field of investment casting, and since little work has been published regarding this application of magnesium alloys, an investigation was undertaken at the Materials Laboratory, Wright-Patterson Air Force Base, to determine the properties of the common magnesium casting alloys when they are poured into investment molds. These mechanical properties were then compared with the mechanical properties of these alloys when sand cast. The two alloys investigated were AZ63 and AZ92, which are normally used in making magnesium sand castings.

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Air Force tests on magnesium alloys AZ63 and AZ92 normally used only for sand castings show that they can be successfully cast by the lost-wax process with mechanical properties similar to standard sand castings.

By WILLIAM F. DAVENPORT, 1st Lt., USAF
and

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All melts reported were prepared in steel pots, under Dow 310 flux and weighed about 20 lb. The procedure was to melt virgin magnesium ingot, heat to the temperature range 1320° to 1400°F, chlorinate for 5 min, superheat in the range 1650° to 1700°F for 10 min, cool and pour.

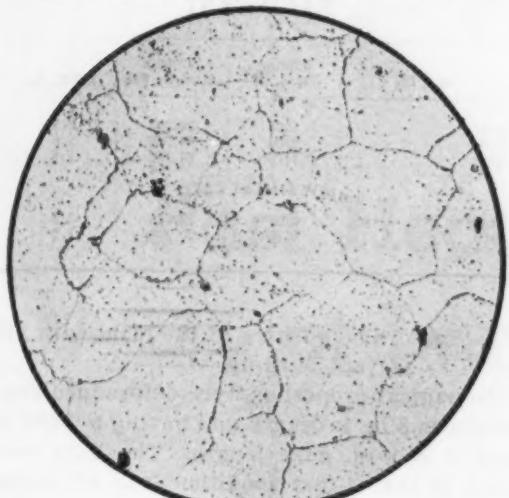
A sulfur-boric acid agent was used to reduce burning subsequent to skimming the 310 flux from the surface of the melt.

Preparing Investment Molds

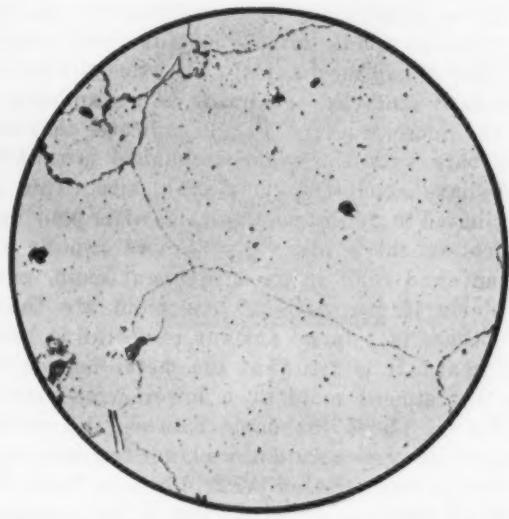
The wax specimens were assembled as shown in Fig. 1. This method allowed the metal to produce sufficient pressure to completely fill the mold in the specimen section. The speci-

THE IRON AGE

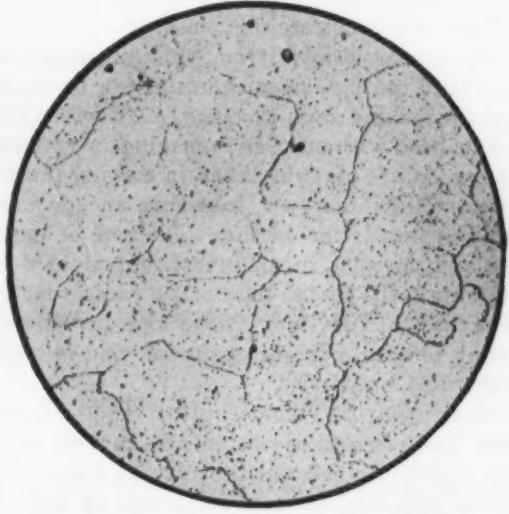
FIG. 2—Comparison of microstructures of AZ63 alloy as investment cast and as sand cast. All micros 300X; Picral etch.



Sand cast specimen.

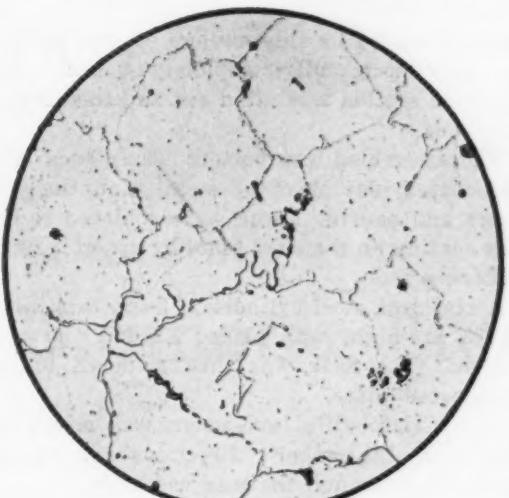


Large grain size in investment cast specimen poured at 1475°F. This bar showed low mechanical properties.

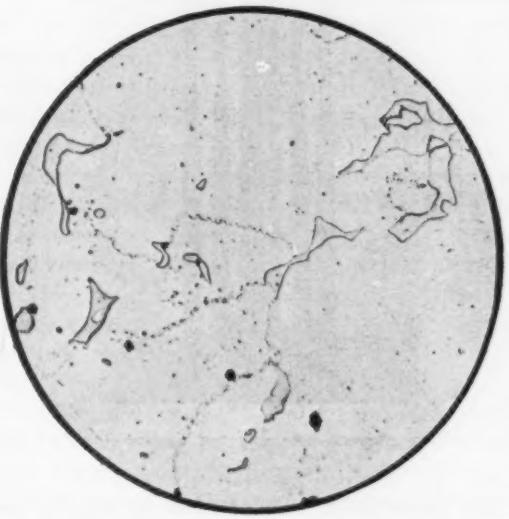


Investment cast specimen poured at 1250°F. This bar had mechanical properties comparable with those of the specimen at top.

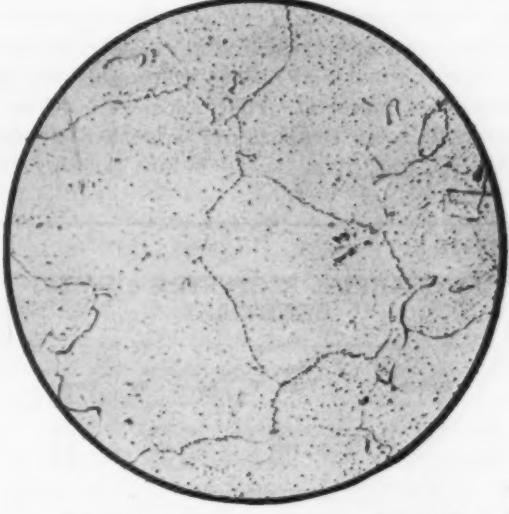
FIG. 3—Comparison of microstructures of AZ92 alloy as investment cast and as sand cast. All micros 300X; Picral etch.



Sand cast specimen.



Investment cast specimen poured at 1475°F, with large grain size and consequent low mechanical properties.



Investment cast specimen poured at 1250°F, with grain size and mechanical properties comparable with those of the sand cast bar.

mens produced by this method of wax pattern assembly were all completely sound. The threaded section was filled out and the surface was good.

The assembled wax pattern was placed on a wax-coated, flat sheet of metal, and the wax risers and pouring sprue were soldered to the wax coating on the steel plate by use of a small soldering tool.

A stainless steel cylindrical flask, 5 in. diam by 12 in. high, was placed around the wax pattern. The flask was then soldered to the wax-coated plate.

Kerr Cristobalite investment was mixed according to the maker's directions and poured in the flask around the wax assembly.

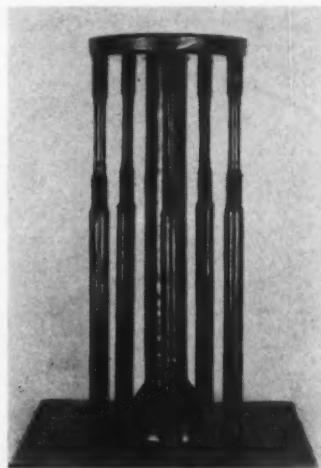


FIG. 1—Wax pattern assembly for casting the test bars.

The investment was allowed to set up and then was placed in the melt-out oven at a temperature of 180°F. The molds remained in the melt-out oven overnight. The next morning they were transferred to a high temperature furnace and slowly heated to 1350°F to burn out organic material and to thoroughly set the investment material. The molds were furnace cooled to room temperature and then flushed with SO₂ gas immediately before pouring the

TABLE I
MECHANICAL PROPERTIES OF AZ63
SAND CAST

Melt No.	Pouring Temp., °F	Ultimate Strength, Psi	Elong., %
9165.....	1500	28,800	6.0
9164.....	1500	28,400	5.5
9155.....	1475	28,900	6.0
INVESTMENT CAST			
9188.....	1250	28,000	6
9155.....	1475	22,000	2

TABLE II
MECHANICAL PROPERTIES OF AZ92
SAND CAST

Melt No.	Pouring Temp., °F	Ultimate Strength, Psi	Elong., %
9167.....	1500	24,700	3.5
9174.....	1500	24,900	3.0
9179.....	1475	24,700	2.5
INVESTMENT CAST			
9189.....	1255	23,800	3.0
9179.....	1475	20,300	1.0

magnesium. The flushing of the mold with SO₂ served to prevent burning.

Mechanical properties were determined from specimens 3 in. in length and having a 0.250 in. diam in a 1 in. gage length. The bars were tested in the as-cast condition, and all values given here represent an average of six test bars.

Mechanical properties obtained from AZ63 alloy are given in Table I.

It was noted that the test specimens cast in investment molds with a pouring temperature of 1250°F had mechanical properties similar to standard sand-cast specimens. An examination of the microstructure, Fig. 2, indicates that the test bars with the same mechanical properties also have about the same grain size. This is attributed to similar cooling rates after pouring.

Cooling takes place much more rapidly in green sand than in an investment mold, particularly if the walls of the mold are thick and there is a large amount of metal to hold the heat. It is felt that the metal poured in the investment mold at a lower temperature cooled at about the same rate as the metal poured into green sand at a higher temperature.

Results from testing AZ92, given in Table II, indicate the same situation, that is, bars poured into investment molds at a lower temperature have about the same grain size and about the same mechanical properties. The micrographs in Fig. 3 also illustrate this point.

Conclusions drawn from this investigation were that the two magnesium alloys normally used for making sand castings, AZ92 and AZ63, may be used with success in making investment castings. Care must be taken in making investment castings, however, to assure an adequate cooling rate for the casting. The lack of moisture and porosity in an investment mold does not permit the metal to cool as rapidly as in green sand. This may cause the investment casting to have a larger grain size and reduced mechanical properties.

Lower pouring temperatures and smaller gates, feeders and risers in the casting have been found to increase the rate at which the casting will cool after pouring and so tend to promote the finer grain size and maximum values of the mechanical properties.

Fast Heating of Large Diameter Pipe



By RICHARD M. HORTVET
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A. O. Smith Corp.,
Milwaukee

A unique application of the high-temperature-head principle heats pipe and tubing rapidly. Unit solves problem of inadequate length of regular furnaces.

AN application of the new high temperature head principle for rapid heating of tubing has been designed and constructed by the A. O. Smith Corp. and has been in operation at the pipe plant in Milwaukee for a little over a year. This installation is unique because it quickly solved the inadequacy of the regular furnaces.

Steel plate is formed and welded into tubes 40 ft long in the electric welding shop and transferred to the reducing plant for forming into smaller sizes. The pipe sizes, on high production runs, as they are heated in these furnaces appear in Table I. Short runs of intermediate sizes are also heated in these units. This pipe is used for oil well casing, gas and oil transmission pipe lines, and other high pressure operations requiring extra strength. The welded pipe is heated to approximately 1800°F and reduced automatically to the proper sizes. It is then reheated for grain refinement in another furnace.

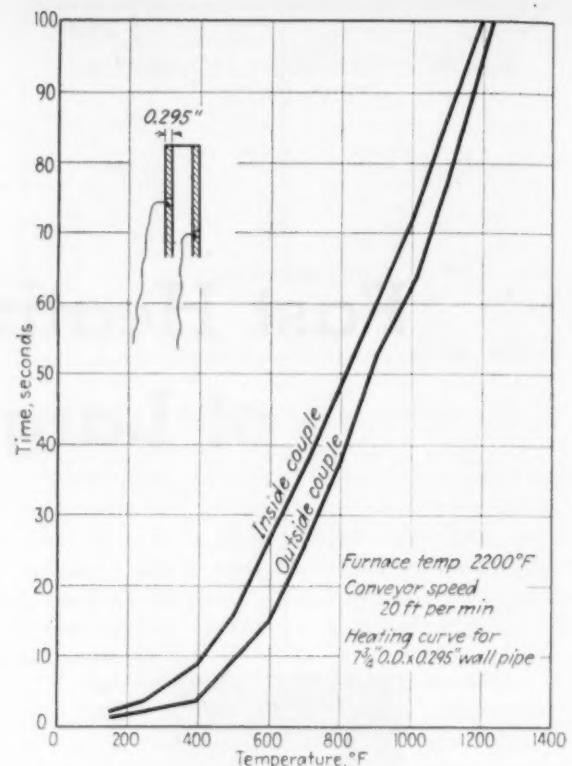
The heating for reducing is performed in a special furnace, in which the pipe is conveyed lengthwise through the furnace and pushed out into the reducing machine. Originally, this furnace did not have sufficient preheating length to deliver the desired production. Rather than add to the length of the preheat zone in the original furnace, which would be a major operation, it was decided to try the high temperature head principle. In this way production would be increased by preheating the work entering the original furnace from room temperature to 1000°F, and at the same time determine the advantages of the high temperature heating principle.

Four horizontal cylindrical furnaces were constructed as shown in the accompanying illustration. These furnaces were set in line,

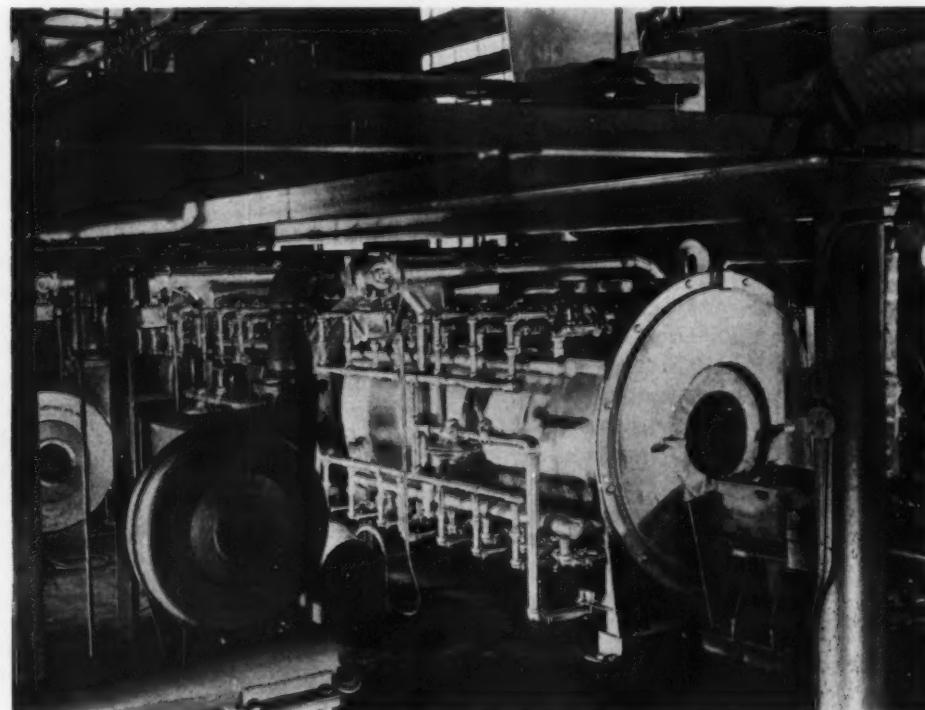
with water cooled driven rolls between each furnace for conveying the pipe. These rolls were spaced on 9-ft centers and driven through chains from one drive unit. The furnaces are 7 ft long x 30 in. ID, allowing approximately 9 in. between furnace walls and tube for combustion space. Walls are made of two courses of 3000°F insulating fire brick, 4½ in. thick, plus 1 in. of insulation, or total wall thickness of 10 in. All are encased in a ¼-in. steel shell.

Each furnace is equipped with 28 1¼-in. North American combustion burners arranged in four rows of seven each on 90° centers and mounted to fire tangentially around the furnace wall. The burners have a capacity of 220,000 Btu per hr each with 3250 Btu Butane gas, with 16 oz air pressure. These burners, although of the nozzle mixing type with resulting high turndown ratio, operate from an atmospheric pressure regulator which holds correct ratio over the wide control range.

Two 1½-in. atmospheric regulators are used per furnace, divided so that each regulator handles two rows of seven burners. The air is controlled from a single adjustable port control valve, driven with a two-position control motor. The air for each furnace is supplied by an individual turbo-blower having a



Heating curve for 7 1/2-in. OD x 0.295-in. wall pipe, 40 ft long. Thermocouples imbedded on inside and outside walls of the pipe.



End unit of the four furnace high temperature heating installation at A. O. Smith. These preheaters bring tubes to be reduced up to 1000°F before they enter the final heating furnace where they reach 1800°F.

TABLE I
SIZES OF PIPE HEATED

OD, In.	Wall Thickness, In.	Weight Per Ft
10%	0.400	36
	0.450	40
	0.500	44
	0.557	49
9%	0.272	17
	0.317	23
	0.362	26
12%	0.476	63

capacity of 1150 cfm at 20 oz, with direct connected 10 hp ball-bearing motor. In addition, a 2½-in. duplex safety shutoff valve was installed in the main gas line to each furnace, which closes the gas on failure of either the gas or air pressure.

Each furnace is equipped with a Leeds & Northrup indicating controller, and Ray-o-tube pyrometer sighting into a closed-end refractory tube imbedded through the furnace wall. This registers the temperature and controls the air

and the fuel input. Temperatures are set for 2000°F. It was found that the rapidly circulating combustion gases, wiping tangentially over the wall, result in a completely uniform heating of the wall and radiation to the work. There are no visible hot radiant spots and the whole wall is uniformly incandescent. The tube travels through the furnaces at 20 fpm. Production from the four furnaces totals 30 tons of pipe per hr uniformly heated to 1000°F.

Check runs have been made with thermocouples imbedded on the surface of the tube; also imbedded in the wall of the tube to prove that the work was uniformly heated throughout. Because of the exceptional results obtained, it is proposed to construct another unit with sufficient number of furnaces to bring the tube from room temperature to the correct reducing temperature in one continuous operation. Because of the cylindrical shape and heavy wall of the tube, as well as the low final temperature used, longer furnaces than common were possible.

Short Circuit Etching Of Copper

IN conjunction with their development in Belgium of a new process for electrolytic polishing of copper and copper alloys, M. Jaroszewicz-Bortnowski and J. Schoofs also perfected a technique for short-circuit etching of the specimen. The process, described recently in the Engineer's Digest, London, consists mainly of short-circuiting the electrodes immediately after the polishing current has been switched off, and the oscillating specimen stopped at a distance of 2 in. from the cathode.

During electrolytic polishing, a difference in concentration of the electrolyte is established in the vicinity of the electrodes, and increases with the polishing time up to a limited value, depending on process conditions. An emf is created, the bath acting like a storage battery which discharges with reverse current when the electrodes are short-circuited.

The specimen then forms the cathode, and copper is deposited on the polished surface. Since the potential difference is very small, the deposit is not uniform, its thickness depending upon grain orientation. If alpha brass is etched in this manner and examined under the microscope, some grains will appear yellow (free of copper deposit), others are deep pink, and the

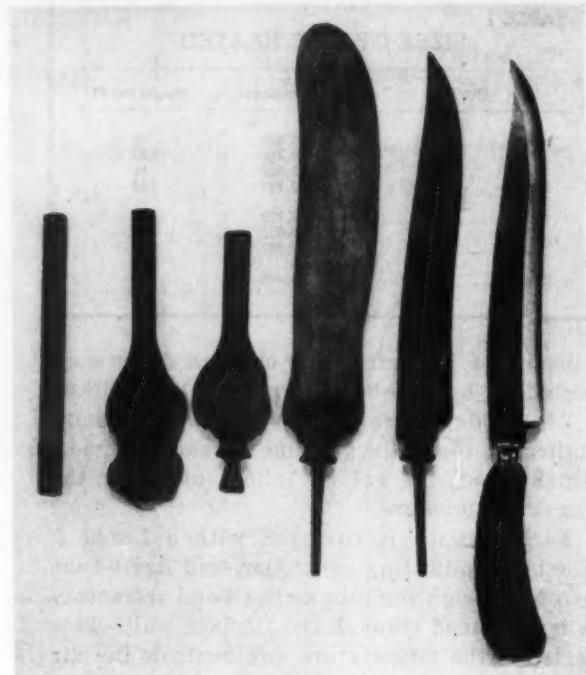
entire scale of colors between these extremes can be observed.

Brasses and copper-nickel-zinc alloys give the clearest micrographs by this method. Intensity of contrast and fineness of detail depend on the quantity of copper deposited and, therefore, (a) on the short-circuiting time, and (b) on the mean copper concentration, too short an etching time gives too thin a deposit and insufficient detail contrast; too long a time blurs the detail.

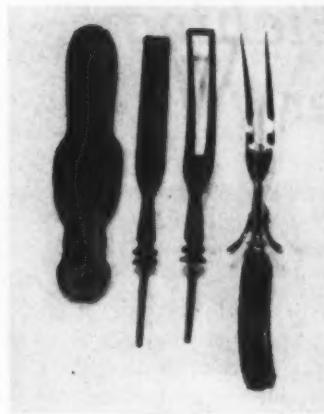
Experiments have shown that the optimum time is proportional to the size of the surface to be etched. For a given etching time, on the other hand, there is an optimum concentration which gives sharpest contrast.

Short-circuit etching may also be applied if the specimen is not oscillated during polishing, in which case the etching time should be slightly longer. With oscillation speeds of 2 full strokes per sec, however, the gradient of concentration is not sufficient for successful short-circuit etching. Ingot segregations influence the speed of metal dissolution in all electrolytic processes; it was found, therefore, that raw ingot material is not suitable for electrolytic etching.

The manufacturing operations are shown here in producing a high-chromium high-carbon stainless steel carving knife. The steps in producing a stainless type 410 carver fork are shown below.



Forging Stainless Steel



By LESTER F. SPENCER
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New Britain, Conn.*

Satisfactory stainless steel forgings can be produced if the forger understands the inherent characteristics of specific grades of steel. Methods and equipment used in forging stainless stock are described in this article.

FORGING stainless steel presents no problem, as evidenced by the number of industries in this field either producing forgings on a contract basis or for their own consumption. No difficulty in producing satisfactory forgings should be experienced, even with free machining types such as AISI 303, 416 and 430F.

This assumption precludes a complete understanding and respect for the inherent characteristics of the specific grade to be forged. The

knowledge of these peculiarities will lead to precautionary steps in those critical phases as heating for forging, forging practices, and heat treatment procedures. Later, the experience factor will materially aid in the establishment and acceptance of a standard forging procedure for stainless steels.

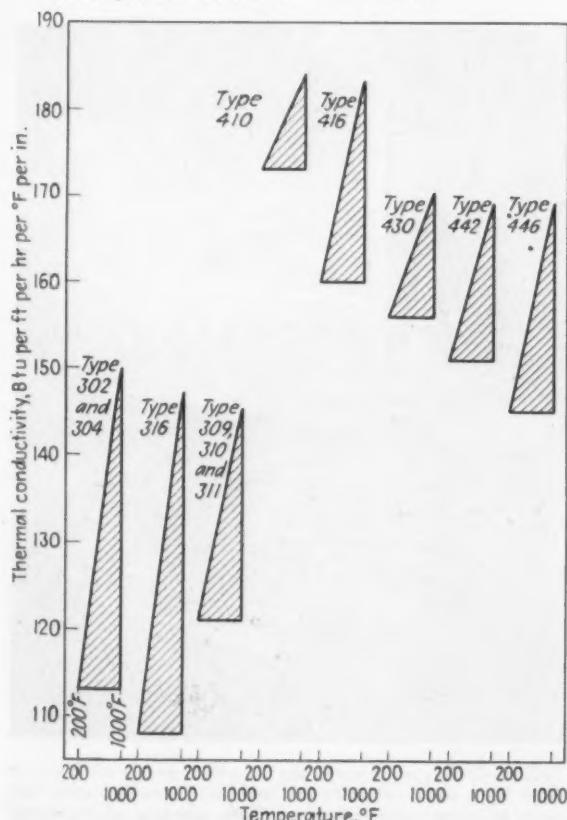
All grades of stainless steel possess remarkable high temperature strength, and deformation is more difficult than that experienced with

carbon and low alloy forging steels. Thus, forging equipment must be of sufficient capacity so that heavier and more frequent blows can be made to produce a given amount of deformation. Temperature ranges for forging have been tabulated by many of the stainless steel producers.

Ferritic stainless steels are employed where high corrosion resistance and strength are required and hardness is not essential. Typical applications are lever arms, shafts, and some items in the cutlery field such as table spoons and forks, ferrules, and bolsters. They are the easiest of the stainless compositions for forge, working with light blows followed by rapid working to complete the forging. Where temperatures reach the minimum within the acceptable forging range, it is good practice to revert to light blows. In the event that reheating is necessary to complete the forging, the reheat temperature is usually kept at 1900°F. A finishing temperature as low as 1400°F is used where maximum grain refinement is desired.

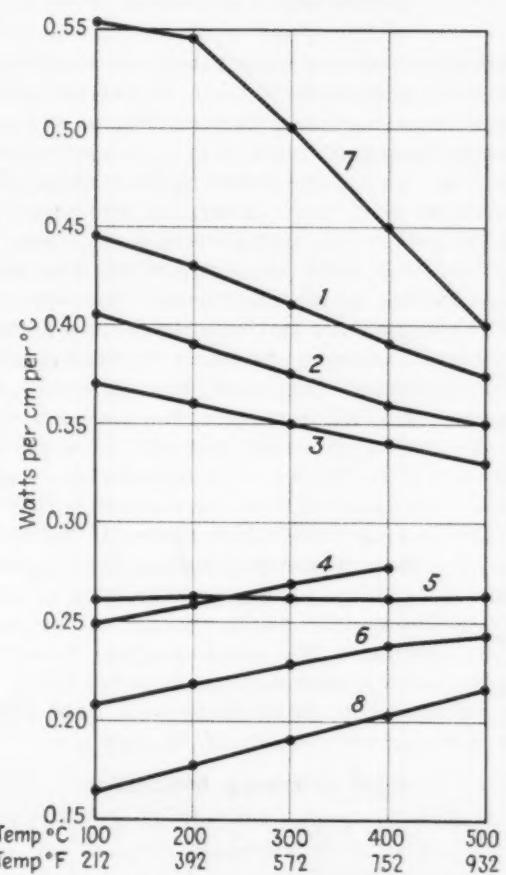
In forging, ferritic steels have a propensity toward grain growth upon exposure to prolonged heating at the forging temperature. Where small forgings are made from 1½-in. rod or smaller, the normal time required in heating will not unduly influence grain growth. On heavier sections, preheating is recommended to reduce the exposure time at high

FIG. 1—Thermal conductivity of specific stainless steel grades between 200° and 1000°F.



Courtesy Crucible Steel Co. of America

FIG. 2—Thermal conductivity of steel.* Adapted from results obtained by S. M. Shelton and W. H. Swangere, National Bureau of Standards.



CHEMICAL COMPOSITION, PCT.

Alloy	C	Mn	Si	Cr	Ni	Comments
1	0.35	—	—	0.46	1.37	
2	0.51	1.65	—	—	—	
3	0.10	—	—	5.15	—	
4	0.07	—	—	12.0	—	Within type 410 limits
5	0.08	—	—	15.0	—	
6	0.10	—	—	25.0	—	Within type 446 limits
7	wrought iron	—	—	18.0	9.0	Within type 304 limits
8	0.07	—	—	—	—	

*This unit is 1 watt per sq cm for a temperature gradient of 1°C per cm, and equals 57.9 Btu per hr per sq ft for 1°F per ft.

heat to bring the forging bar stock to the upper forging temperature range. It is mandatory that furnace loading be controlled so that in a sequence of forging the last bar to be forged will not be exposed longer than the maximum allowable time for the control of grain size. Unfortunately, once grain growth occurs there is no remedial heat treatment that will permit recrystallization. Because of the nonhardenable characteristics of these steels, it is not necessary to provide a controlled cooling after the forging operation. However, the formation of hot working strains makes it advisable to provide an anneal prior to the cold trim operation.

The martensitic grades of stainless steel, in general, have sufficient carbon to permit a substantial hardness upon the application of a

standard heat and quench heat-treatment procedure. Advantage is taken of the properties of extreme hardness, wear resistance and corrosion resistance for a variety of applications such as surgical and dental instruments, shafts, valve material and cutlery. A peculiarity of these analyses is that corrosion resistance is not realized until the composition has been heat treated to the martensitic structure.

The martensitic stainless steels have a characteristic common to many forgeable alloy steels, namely, that they are extremely air hardening. This precludes the use of a controlled cooling procedure, not only in annealing but also after forging. As with ferritic steels, small sectional bar sizes can be heated directly to the forging temperature range. However, in large sections a preheat shortens the exposure time at high heat. Forging with initially light blows followed by rapid working to the complete forging is the usual practice. However, as the lower temperature range is reached, it is recommended to finish forge with light blows so as to prevent tearing of the steel.

Cold Trimming Difficulties

Martensitic grades are fully annealed so that they are at their maximum softness for cold trimming. Difficulties experienced in trimming these steels have been traced to the oversight of controlled cooling after an anneal, which renders the material too brittle for trimming. In many instances hot trimming is performed. The difficulty of this, however, is the discomfort to those employed in trimming.

Austenitic types are by far the most corrosion-resistant of the stainless steels. They are characterized by nonhardenability by the standard heat and quench method. However, high hardness can be obtained through cold work. A precaution to observe in the working of these steels is their susceptibility to intergranular corrosion, which, when present in sufficient amount, will materially reduce corrosion resistance. Thus, it is essential to avoid the temperature range of 800° to 1500°F, this range being accepted as the sensitizing range of austenitic stainless where intergranular carbides are most likely to form.

The rate of formation of intergranular carbides is a function of time and temperature, and both factors must be considered for the avoidance of this condition. In finishing operations, such as an anneal, no external contamination on the forging prior to the anneal can be tolerated. Oil, smut and other carbonaceous material will form with the chromium to form harmful intergranular carbides.

The forging of austenitic stainless is some-

what similar to that practiced with the ferritic stainless steels. Controlled cooling is not mandatory since these alloys are nonhardening. However, it may be necessary to anneal prior to cold trimming to eliminate hot working strains that may have occurred in the forging operation.

The precautions in the heating of stainless for forging are similar to those for heating carbon and low alloy forgeable steels. Special attention must be made to furnace equipment as well as to the economics underlying the choice of furnaces and fuel, uniformity of temperature and control within a furnace, furnace loadings to assure an adequate heating to forging temperature, and insuring against overheating.

Slow heating to forge temperatures is recommended. However, in many instances this is not too practical, especially where continuous production is the rule. Avoidance to exposure to immediate high heat temperatures, as would be experienced in placing bar stock directly into a forging furnace at the forging heat, often can be made by inserting a preheat. The use of a preheat is essential to the higher carbon stainless steels. Those stainless compositions that have low carbon content, however, need but the ordinary careful handling experienced with the alloy steels usually forged. Section size will also dictate as to whether a preheat is necessary, heavier sections requiring a preheat.

The lower thermal conductivity of the stain-

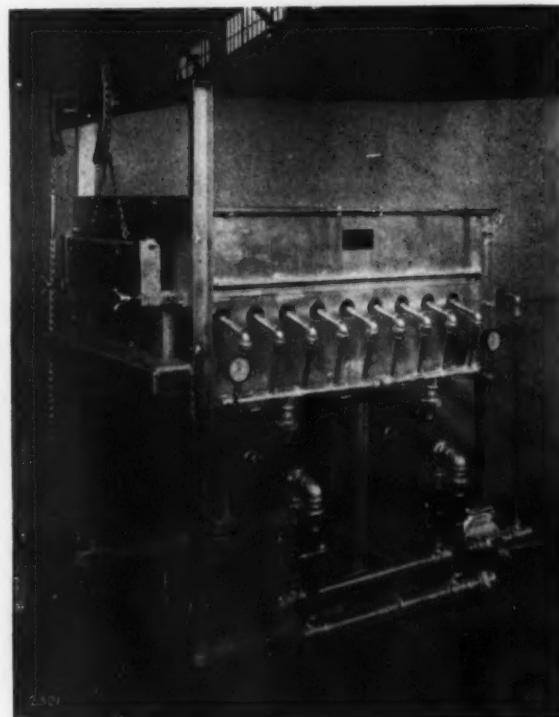


FIG. 3—Slot type furnaces can be either gas or oil fired, or fired by a combination of gas and oil, depending upon fuel costs in a particular locality. Photo courtesy of American Gas Furnace Co., Elizabeth, N. J.



FIG. 4—The board hammer is supplied with forging stock from the slot type furnace on the right. This method of forming is widely used in forming small stainless items. Photo courtesy of Grover Tank & Mfg. Co., East Chicago, Ill.

less steels makes important the allowance of sufficient soaking time to permit formation of a full austenitized structure. This is particularly true with both the high-carbon, high-chromium and austenitic stainless steels. Some ideas as to the thermal conductivity of the stainless steels as compared to other forgeable alloys is given in Figs. 1 and 2. The scale formation that appears upon the stainless compositions is usually thin but tenacious and, at times, more difficulty is experienced in scale removal than with the ordinary forgeable alloy steels.

The slot type furnaces, as shown in Fig. 3 are common types. They either can be oil or gas fired or a combination of both, the choice depending upon the economics of the particular locality. The rotary hearth furnace is a compact unit that delivers up to 900 lb of forgings per hr. Heating time for forging is controlled by adjusting the speed of travel of the turn-table hearth inside the furnace. One operator can load and unload the furnace, which will serve either one or two hammers at full production speeds. While limited as to the size of bar stock that it can handle, as a production unit, within specific size limitations, it can serve adequately.

The use of induction heating for heating for forging has taken rapid strides and many advantages are listed in the use of this mode of heating. The only objectionable feature is the high initial cost. However, this cost can be amortized where full production is the rule.

Regardless of the type of forge furnace used, it is imperative that adequate temperature control equipment be installed. This control equipment either may be the radiation type of controlling pyrometer or the standard controlling resistant pyrometer with a platinum-rhodium thermocouple. In the use of this type of thermocouple, adequate protection should be made

against any contamination from the furnace atmosphere and frequent checks should be made so as to determine the accuracy of the instruments.

Furnace design should be such that there is no impingement of flame on any part of the material to be heated. This is a cardinal rule of most commercial furnace designers. However, it is a point too important to overlook. In the use of the thermocouple, the positioning of the thermocouple is important. The thermocouple should be as close to the heated material as possible so that a true temperature recording can be obtained. Because of the sensitivity of these instruments measuring temperature, some thought of protection from hammer vibrations should be made. Thus, either rubber mountings or spring suspensions may protect the instruments from the jarring effects of the hammer. Frequent checks on the accuracy will determine the effectiveness of the specific mounting arrangement.

In some instances optical equipment is used for measuring temperature. In the majority of cases the optical pyrometer is used as an auxiliary to check actual bar forging temperatures. The optical instrument is reliable in a forging shop, but the instrument has limitations. The accuracy of the readings obtained is affected by such factors as the presence of scale on the heated body, the presence of smoke, the distance between the measuring body and the optical pyrometer, and the reflectivity of incandescent flames upon the furnace walls.

Forging Equipment

There are a number of forging machines used in forging stainless steel, among which are forging rolls, Bradley hammers, board drop hammers, steam and air drop hammers, forging presses, and forging upsetters.

The backbone of the forging division is the hammers. At Landers, Frary & Clark, the board drop, as shown in Fig. 4, is most widely used and in the forming of small stainless items. In this type of machine, the force of gravity is employed to strike the blow and the transmitted power is used to raise the ram in striking position. These hammers are rated up to 7500 lb, in terms of the weight of the ram, called the falling weight. The power for raising the ram is usually supplied by either a direct drive motor or from a lineshaft. The height of ram drop is proportional to the size of the hammer and with the manufacturer.

Steam and air drop hammers have greater capacities and are used where larger forgings are made. Power is obtained by a combination of gravity and supplied power. While the board drop hammer is a nonvariable striking hammer, either the steam or air drop hammer is controlled by foot pedal. The question as to whether steam or air should be employed as

the motivating power is dependent entirely upon economics. In either case, maintenance is important since power losses may be tremendous on poorly maintained equipment.

Although the author has little experience with either the upsetter, or forging press, there are many outstanding examples of forging stainless steel with these types of equipment. For example, there is the forging of valve seat inserts in the 2-in. and 2½-in. upsetter and the extruding of exhaust valves in the 5C, 7C and 10C forging press. In reality, it is similar to



FIG. 5—Forging rolls, used extensively in forming stainless, are adaptable to the production of flats and flat forms. Photo courtesy of Ajax Mfg. Co., Cleveland.

forging done in the conventional drop forge equipment with the exception that the forging is done in a horizontal direction rather than in a vertical plane. Forging is accomplished in two or more operational steps, depending upon the design of the item. Die material is similar to that employed in the drop forge equipment, and rapidity of operation insures a high productivity. The forging press relies on the slow application of power. This is the highest capacity type of equipment available in this field of work.

Both forging rolls, shown in Fig. 5, and the Bradley hammer, are used extensively by Landers, Frary & Clark. Forging rolls are employed in the rolling of flats and forms, while the Bradley Helve hammer is used in cold forming, rapid drawing, edging and forming. The Helve hammer is characterized by its rapid speed of op-

eration and is suited ideally in the drawing of tongs on forged cutlery material.

Heat treatment procedures play an integral part in forging. Upon the application of a heat and quench on the martensitic stainless compositions, followed by an appropriate draw, a variety of mechanical properties is obtainable to serve practically any application where a combination of corrosion resistance with either wear resistance or cutting ability is required. In hardening martensitic stainless steels, furnace design and furnace selection are important. Thus, as in heating for forging, flame impingement is strictly taboo, adequate pyrometric control is essential, and furnace cycle should be such that an adequate heating period is realized so that a complete solid solution is obtained prior to quenching.

Heating Time

Both austenitic and martensitic stainless steels are sluggish and the time necessary to realize a complete solid solution of austenite is greater than in the heat treatment of carbon or low alloy forging steels. Where production requirements are high, any continuous furnace is quite acceptable. Landers, Frary & Clark successfully used a continuous roller-hearth conveyor furnace, both hardening and tempering units arranged in tandem with the oil quench and loading table spaced between them, for both forged and flatware.

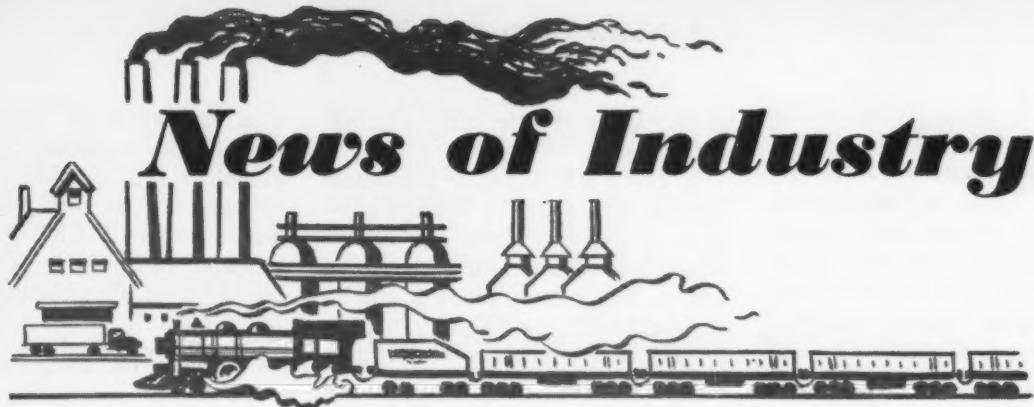
To those more familiar with batch type furnaces, the installation of a continuous furnace will mean that greater care is to be exercised so that maintenance of the furnace will be at a minimum. In the use of resistance wire or coil for electric heating, proper precautions are required to protect the bottom units below the hearth from loose scale. Either excessive scale is removed prior to entry into the furnace and/or a catch tray is placed below the rollers to prevent scale from falling on the elements and causing short circuits. Overloading is also a serious problem to one unacquainted with the continuous furnace. It must be remembered that the furnace, if zoned, has a definite heat input. Upon excessive extraction of heat from one load, more time must be realized for temperature recovery in the zone affected.

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News of Industry

Fastener Industry Expects a Good Year

Biggest problem of industry is high costs . . . Some firms pinched by short steel supplies . . . But demand is good, most companies report—By BILL LLOYD

Cleveland—Steel supply loomed as the major hurdle for the fastener industry this week as demand for headed and threaded products for the first half of this year appeared to be equal to or better than the first half of 1949.

Beyond the first half, major producers of these products hesitate to make any serious predictions, but a conservative optimism heralds the guess that 1950 volume will not be more than 10 pct, tonnage-wise, under 1949 when the industry was catching up. Shipments during 1949 are estimated at 955,000 tons, worth \$330,000,000.

No Problem from Inventories

Present market trends, according to sales executives, indicate that buyers are inventory conscious and are not piling up inventory. This is due in part to deliveries, which are currently on a 4 to 6-week basis. Some observers size up the situation as a good omen for the continuance of business, on the assumption that as requirements develop, the orders will come through at the producer level and not be filled from customer inventory.

Long range problem of the industry this year, in the opinion of

some observers, is volume. Right now, the first 6 months appear to be in the bag, based on demand from the major consuming industries. Automotive demand, barring long continuation of the Chrysler strike, looks good, as does distribu-

tor business. Farm implement demand looks fair, but railroad demand looks pretty weak. Demand from household appliance producers is good, but export business, as one producer put it, "is going to pot."

Some of the big segments of the fasteners industry are the hardest hit by the steel shortage. Supplies of wire and wire rods are limiting production in some plants. Bar supply is generally adequate.

The industry's breakeven point
Turn to Page 112

Supreme Court Upholds FTC Rule in Cease-and-Desist Cases

Washington—The Supreme Court has ruled that companies served by the Federal Trade Commission with cease-and-desist orders are required to file reports explaining how they are complying.

Justice Jackson delivered the 7-0 opinion of the high court, holding that FTC was within its rights in insisting on the reports as a part of its anti-monopoly activity, and rejecting the argument of the Morton Salt Co. and the International Salt Co. that the FTC would be engaged in a mere "fishing expedition" to see if it could turn up evidence of guilt.

The FTC contends that Congress intended it to obtain the disputed "compliance reports" as part of the agency's enforcement work and that the power is essential to effec-

tive enforcement of anti-monopoly laws of the country.

Justices Douglas and Minton took no part in the case.

Allis-Chalmers Offers Pensions

Milwaukee—Allis-Chalmers Mfg. Co. has offered all salaried and hourly paid employees a plan providing for maximum pensions of \$100 a month, including social security benefits. The plan would be non-contributory. Pending acceptance of the plan, no effective date for the plan has been set.

Wheeling Stockholders Approve

Wheeling, W. Va.—Wheeling Steel Corp. stockholders have authorized adoption of the new pension plan for all employees and officers of the company.

Stockholders representing 70 pct of the outstanding stock signified their approval of the program.

Fastener Outlook Good

Continued from Page 111

is high and while the steel price increase was passed along, many companies are facing new wage and pension demands which threaten the existing profit margins. Without volume, the fasteners industry, like a good many others, would be in difficult straits.

On the other hand, because costs are high, the price softness which developed in the fasteners market in 1949 is not expected to rear its head this year. And this price stability should insure quick transmittal or requirements into orders.

Also in the industry's favor is productivity, which has been increasing gradually, and the presence of a lot of new automatic equipment on the production lines.

Backlog About 6 Weeks

Backlogs, which have been coming down steadily since the end of the steel strike, now average about 6 weeks for the industry. However, the coal strike and attendant uncertainties are holding up releases on a substantial volume of business which has already been placed. The industry is also witnessing a reversal of a trend, among some of its customers' following the summer lull of 1949, to let inventories get too low.

In brief, producers of nuts, bolts, screws and rivets report that demand is good, costs are high, and steel supply in many segments of the industry is inadequate.

Where wage and pension demands must be met, there is some doubt that the price advances made following the steel price increase will be sufficient. But by and large the fasteners industry, harboring fond memoirs of the first postwar years, is back to normal.

Resume Your Reading on Page 111

Allied Research Expands Line

Baltimore—New products announced recently by Allied Research Products, Inc., include a powdered Iridite coating for the corrosion protection of zinc and cadmium, a new Iridite finish for aluminum and a new type of or-

ganic brighter for zinc plating solutions.

Iridite #8-P, the new powdered Iridite, is intended to achieve savings in shipping costs and eliminate the need for returnable packaging. The new aluminum finish, Iridite Alcote, provides paint adhering characteristics, and corro-

sion and abrasion resistance believed unobtainable with other chemical dip aluminum finishing processes. The zinc plate brightener compound, ARP #3, will be supplied in liquid form for use in any type of zinc plating bath. It is claimed to produce better results at lower cost.

Coal Shortage Hampers Production Efforts

Prospect of shutdown is a bitter pill for production men bent on breaking records . . . Several records fell during January . . . Labor productivity is high.

Pittsburgh—The prospect of a shutdown for lack of coal and coke must be particularly bitter to steel mill production men who have been outdoing themselves in an effort to satisfy pent up demand.

With their own labor difficulties settled, management and workers in the mills have been going all out to maintain production at peak level. At least two companies in the Pittsburgh-Ohio area established all-time records in some mills and departments during January.

Carnegie-Illinois Steel Corp. reported all-time records by blast furnaces in two plants during December and January, plus nine other all-time production marks. Jones & Laughlin Steel Corp. also reported iron-producing, coke making and steelmaking records during January.

C-I Sets New Output Marks

Here's the record for Carnegie-Illinois:

Blast Furnaces—Six furnaces at Carrie Furnaces, Rankin, Pa., produced 192,521 net tons during January, more than 2000 tons over the old mark set in December. The previous high of 190,037 was established in August, 1948. Five furnaces at Ohio Works, Youngstown, produced 148,217 tons in January, shattering the previous high of 145,739 in December. The best previous output for one month was 145,381 tons in October, 1940.

Rolling Mills—Irvin Works, 80-in. hot strip mill, 206,631 tons, previous high 193,882 tons August, 1949; three-stand cold reduction sheet mill, 54,300 tons, previous high 53,739 tons August, 1949; five-stand cold reduction tin mill No. 1, 30,706 tons, previous highs 29,970 tons December, 1949, and 29,590 tons October, 1948; five-stand cold reduction tin mills (combined output), 74,399, previous high 73,985 tons March, 1949.

Miscellaneous—Irvin Works, No. 1 galvanizing line, 7441 tons, previous highs 7363 tons Decem-



"They're banking No. 2 today."

ber, 1949, and 6846 tons December, 1948; 56-in. pickler, 48,730 tons, previous high 45,464 tons August, 1949; total for all picklers, 135,807 tons, previous high 133,159 tons August, 1949. Clairton Works, No. 2 furnace, ferromanganese production, 7415 tons, previous high 7377 tons May, 1949. Duquesne Works, No. 2 furnace, ferromanganese production, 10,901 tons, previous high 7893 tons achieved during July, 1941.

Records Shattered by J. & L.

J. & L. reported that its No. 1 blast furnace at the Otis Works, Cleveland, broke a 20-year record last month; No. 9 openhearth at the same plant established a new all-time monthly mark; that the 96-in. hot strip mill set a new all-time 20-turn weekly record at Pittsburgh Works; that a new mark was set last month on No. 2 seamless hot mill, Aliquippa, Pa., and that by-product coke production in January represented a new monthly tonnage record.

New Lead and Silver Mines Developed in Yukon Territory

New York—A new lead and silver property is now being developed in the heart of Canada's Yukon Territory at Keno Hill near the former Guggenheim development now being operated as United Keno Hill. Consolidated Yukon Mines, Toronto, started to open up the new property about 2 years ago when the lead market was in critically short supply.

Expect to Start Mill in Fall

The company is now mining a vein 30 ft wide by about 1500 ft long with ore averaging 20 pct lead and 50 oz of silver per ton, according to Barry O'Neill, field manager. Sizable pockets of direct shipping high grade are also found in the vein averaging 65 pct lead and 200 oz of silver.

Consolidated Yukon's property in the area is reported at about 30 sq mi, on which some 200 claims have been staked. Operations are largely tunneling into the mountainside, at a maximum depth of 30 ft. The company expects to

start a mill in the fall at an estimated cost of \$750,000.

Shipping costs to Trail, B. C., are put at \$60 per ton. Canada has completed a 300-mile spur to the Alcan Highway at Whitehorse, at

which transhipment to rail can be made. Canada has recently completed a hydroelectric power survey in the Territory which is expected to result in early power for mine and mill operations.

Water Shortages Plague All Sections

Heavy industrial use seen a contributing factor . . . But real cause is lack of proper planning . . . Future needs can be met in most cases—By EUGENE J. HARDY

Washington—Heavy industrial use of water is contributing to the problem of water shortages in every section of the country.

For several years the Geological Survey has been warning the country about the consequences of increasing demand for water without increasing available supplies (THE IRON AGE, Apr. 14, 1949, p. 100). The warnings received little public attention until New York City was hard hit. Now everybody wants to get into the act. The President has appointed a commission, the Public Health Service is pushing its work under the Federal Pollution Act, states and municipalities are making more surveys, and Congress wants to appropriate more money for water resources investigation.

During recent appropriations hearings, members of the House were extremely sympathetic to re-

quests for additional funds for the water resources investigations projects of the Geological Survey. The requested increase amounts to \$1,225,000, which would make the total federal contribution for 1951 about \$4.5 million.

Cost May Become Deductible

This money would be used largely for stream gaging, sediment investigations, chemical quality investigations and ground water (actually, underground) investigations. It would also be used for the cooperative federal-state program under which funds are matched on a 50-50 basis. Under this program, it is expected that about 255 state and municipal agencies will conduct studies during the next year.

Taking further cognizance of the fact that quality of available water ranks with quantity in importance, Congress also has before it several bills which would allow firms to deduct the cost of anti-pollution facilities in computing net income for tax purposes. While none of these measures is likely to be approved during the current session, such approval will be a must as the cost of constructing such facilities continues to rise.

In still another quarter, the General Services Administration has revealed that 18 of the first 24 applications approved for federal loans for advance state and local public works planning are for sewage treatment plants and collection systems. Two are for complete water systems.

Until quite recently it was
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INDUSTRIAL SHORTS

WORLDWIDE MARKETS — GENERAL REFRactories CO., Philadelphia, has entered into a contract to purchase all of the outstanding capital stock of the American-Austrian Magnesite Corp., Pittsburgh. This corporation owns all of the stock of Austro-American Magnesite Co. which owns and operates magnesite deposits and a refractory brick plant near Radenthein, Austria.

WANT TO LEARN? — Five intensive 1-week courses for industrial finishers is being offered by DEVILBISS CORP., Toledo, during the first half of 1950. The tuition-free courses include comprehensive instruction on all spray finishing techniques and the function and care of spray equipment.

WELDING FILM — Production has begun on a documentary film for the INTERNATIONAL ACETYLENE ASSN., produced by Transfilm Inc. The film will describe the basic story of the oxyacetylene flame and show the development of welding as an industrial process.

SAFETY FIRST — The Cleveland district steel plant and strip mill of REPUBLIC STEEL CORP. have been awarded first place in the company's annual steel plant safety contest.

LARGER QUARTERS — The warehouse facilities of the BRIDGEPORT BRASS CO. has been moved from Newark to new and larger quarters at Hillside, N. J. N. H. Mosher, district manager, will be in charge of the new warehouse.

OPENS BRANCH — A factory branch store and warehouse has been opened by LINK BELT CO. in Kansas City. The two story building will be used to carry a stock of conveying and power transmission machinery parts.

NEW LINE — A new line of low hydrogen electrodes is being produced by HARNISCH-FEGER CORP., Milwaukee, maker of P&H arc welders and electrodes. The coatings were developed to produce deposits low in hydrogen, thereby eliminating the under bead cracking.

MORE SPACE — UNITED CHROMIUM, INC., has moved into a new plant comprising 17,000 sq ft at 1700 East Nine Mile Road, Detroit. The new facilities include a research laboratory, offices, pilot plant and warehouse.

CANADIAN MARKET — Taylor Forge & Pipe Works, Chicago, has announced the formation of TAYLOR FORGE & PIPE WORKS OF CANADA, LTD. This new subsidiary will be located at Hamilton, Ontario, and will manufacture wrought steel fittings, spiral welded pipe and a wide range of heavy forgings.

MOVES — A new plant has been opened by METALWASH MACHINERY CORP., formerly of Irvington, N. J., on U. S. Route 1 at North Ave., in Elizabeth, N. J. New machinery has been installed for the manufacture of washing, pickling and drying machinery for metal parts and bakery pan washing equipment.

ALLOY STEEL REP — The Copperweld Steel Co., Warren, Ohio, has appointed the A. R. PURDY CO., INC., Lyndhurst, N. J., as its direct mill representative in New Jersey, Connecticut, eastern Pennsylvania and the major portion of New York State for blooms, billets and bars.

REPRESENTATIVE — The Standard Transformer Co., Warren, Ohio, has appointed the A. J. ELGGREN & SONS CO., Salt Lake City, as exclusive representative for Utah, Idaho and western Wyoming.

Full Production Resumed At Phoenixville, Pa., Plants

New York — Resumption of full scale operations at its Phoenixville, Pa., bridge and fabricating plants has been announced by the Barium Steel Corp. This action makes possible the return to work of 1000 people who have been jobless since the previous owners shut down 5 months ago.

Work Injuries Lower in '49

Washington — Led by the manufacturing industries, safety conditions for workers improved substantially during 1949, preliminary estimates by the Bureau of Labor Statistics indicate.

Nevertheless, work injuries are estimated to have caused the loss of 39 million man-days or the equivalent of a year's production by 130,000 workers.

Work injuries in manufacturing industries showed a 19 pct drop.

AMA to Hold Marketing Conference

New York — The Marketing Division of the American Management Assn. will sponsor a conference Mar. 16 and 17 at which marketing, sales and merchandising executives will exchange information on current problems and practices.

Among the topics for discussion will be compensation, decentralized control of the sales force, application of job analysis to sales supervision and methods of developing greater dealer and distributor cooperation.

Skilsaw Introduces New Tools

Chicago — New tools and accelerated merchandising programs for 1950 highlighted the annual sales meeting of Skilsaw, Inc. held Jan. 8-11.

Skilsaw, pioneer in the manufacture of the electric saw, presented several new Skil tools and modernized versions of others, to 92 men gathered from the company's 33 branches in the U. S. and Canada.

Jones & Laughlin Subsidiary Rolls Out the Barrels

Pittsburgh—The J. & L. Steel Barrel Co., a subsidiary of Jones & Laughlin Steel Corp., has developed into a major, controlled outlet for sheet and strip production of the parent company.

A review of the barrel company's growth since its establishment in 1939, shows that from a production of several thousand oil drums a day at Bayonne, N. J., the company now produces some 25,000 barrels and drums and 35,000 steel pails every eight hours, plus a substantial line of galvanized ware in eight widely scattered plants.

The company figures this is good insurance against the day when demand from other outlets for flat-rolled products tapers off.

Pail and galvanized ware facilities, representing an increase of about 25 pct in plant and equipment, were acquired by the steel barrel company early this year from American Can Co.

J. & L. has no intention, however, of re-entering the galvanized sheet business to provide raw

material to its subsidiary, being content to let the barrel firm obtain its galvanized sheet from the same sources that supplied American Can.

The deal with American Can Co. included two manufacturing plants, one in Toledo, and another in Atlanta, Ga. One American Can steel pail production line is being moved from Chicago to Kansas City for combining with other facilities, and another similar line at Jersey City will be combined with the plant at Bayonne, N. J.

J. & L. Steel Barrel Co. plants are situated at Bayonne, Cleveland, Philadelphia, Kansas City, Kansas; Toledo, Atlanta, Gretna, La., and West Port Arthur, Tex.

Heading up the steel barrel operation is F. T. Barton, one-time president of the United Steel Barrel Co., Philadelphia, which he organized in 1936. His vice-president in charge of sales and distribution is H. W. Lees, former president of Draper Manufacturing Co., Cleveland, acquired by J. & L. in 1944.

Major project for these two men in the immediate future is to market galvanized ware amounting to one tenth of the total output in the United States. A special sales division is being set up.



STEEL BARRELS: Rolling off the production line (top) at the rate of approximately 350 an hour, these 9 gal steel barrels produced at the Cleveland plant are used for shipping service containers for automotive and airplane parts.

PAINT PAILS: Production lines (center) at the Toledo plant turn out 25,000 paint pails in an 8-hr. day.

SPOTWELDING: At Toledo plant (bottom) a worker spotwelds "ears" onto a No. .05 garbage pail.



Chevrolet Speeding Output Of Automatic Transmissions

Detroit — Chevrolet has now built about 8000 of its new Powerglide automatic transmissions. The company is aiming at a monthly output of 30,000 units.

Up to the present time, Chevrolet has been unable to sample all of its 6500 direct dealers and about 2200 associate dealers. Once full production at the present plants is possible, Chevrolet will be able to supply about 20 pct of new car buyers with its automatic transmission unit.

Expand Riverside Field Service

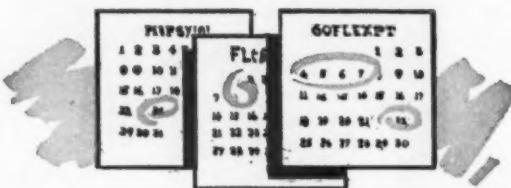
New York—Twenty-four new service centers have been added to the field organization of the Riverside Metal Co., producer of high copper alloys, by the addition of sales offices in Detroit and Roch-

ester and new sales tie-ups with Edgcomb Steel Corp., J. M. Tull Metal & Supply Co., Alaskan Copper & Brass Co. and the Metal Goods Corp.

Steel Casting Charts Revised

New York—Two newly revised steel casting reference charts covering 33 selected grades of carbon and low alloy, stainless, corrosion- and heat-resistant alloys have been compiled by Lebanon Steel Foundry, Lebanon, Pa.

Incorporated in the charts is detailed reference material on specification designations, analyses, physical properties, heat treatments and related data on 18 high alloys, 15 low alloys and carbon steels developed to fulfill a wide range of engineering and design requirements for varied industrial applications.



Dates to Remember

• HELP THE HEART FUND •

Feb. 27 American Society for Testing Materials, spring meeting, Pittsburgh.
 Mar. 3 Society of Automotive Engineers, passenger car, body and production meeting, Detroit.
 Mar. 14-16 Pressed Metal Institute, technical symposium, Cleveland.
 Mar. 16-17 Concrete Reinforcing Steel Institute, annual meeting, Houston.
 Mar. 20-25 Steel Founders' Society of America, annual meeting, Chicago.
 Apr. 3-4 Assn. of Iron & Steel Engineers, spring conference, Birmingham.
 Apr. 4-7 National Assn. of Corrosion Engineers, annual conference, St. Louis.
 Apr. 4-8 Chicago Technical Societies Council, national production exposition, Chicago.
 Apr. 5-7 American Institute of Electrical Engineers, conference on electric welding, Detroit.
 Apr. 5-7 Midwest Power Conference, Chicago.
 Apr. 10-12 American Institute of Mining & Metallurgical Engineers, annual openhearth, blast furnace, coke oven and raw materials conference, Cincinnati.
 Apr. 10-12 American Society of Lubrication Engineers, annual convention, Detroit.
 Apr. 10-14 American Society of Tool Engineers, industrial cost-cutting exposition, Philadelphia.
 Apr. 11-12 American Zinc Institute, annual meeting, St. Louis.
 Apr. 12-14 American Society of Mechanical Engineers, spring meeting, Washington.
 Apr. 12-14 National Petroleum Assn., semiannual meeting, Cleveland.
 Apr. 24 Packaging Machinery Manufacturers Institute, semiannual meeting, Chicago.
 Apr. 25-26 Metal Powder Assn., annual metal powder show, Detroit.
 Apr. 27-28 American Steel Warehouse Assn., annual meeting, Houston.

New York Central RR Buys First Budd Rail Diesel Cars

Philadelphia—The first two of the Budd Co.'s new rail diesel cars, model RDC-1, have been purchased by the New York Central System, according to E. G. Budd, Jr., president.

The new cars cruise at a speed of 70 mph and have a maximum speed of better than 80 mph. They are powered by twin General Motors diesels operating through GM torque converters.

Another model, the RDC-2, differing only slightly from the RDC-1, has been ordered by the Western Pacific RR.

Water Shortage Problem

Continued from page 113

largely in the East that industrial use of water was a major cause for worry. At present, however, the Geological Survey's list of 50 areas where the supply of suitable water "could become serious or is already critical" indicates that industrial and municipal use are major contributing factors throughout the country.

Not Unfavorable for Industry

Contrary to some published reports, Carl G. Paulsen, chief hydraulic engineer of the Geological Survey, points out that listing of certain areas as "critical" does not necessarily make them unfavorable for industrial development. This is due to the fact, says Mr. Paulsen, that "many areas experiencing shortages become water conscious, arrange for complete investigation of their existing and potential supplies, develop all sources found to be practical and continue at a high level through effective water management, without resorting to extensive engineering works."

A partial list of the short areas follows:

EAST—Water problems created by increasing industrial and municipal use. No serious droughts. Investigations needed into quantities of water used, methods of increasing efficiency of use and of long-term water needs.

NEW ENGLAND, Baltimore and Philadelphia—Declining water in heavily pumped industrial areas. Encroachment of

salty or other poor-quality water occurring in places.

LONG ISLAND—Somewhat improved over 1930's.

NEW YORK CITY and metropolitan New Jersey—slight drought has caused present situation. Large scale construction will meet only short-term needs. Long-term appraisal needed.

SOUTHEAST—Deficiencies due largely to overpumping of ground water in rapidly growing industrial areas. Surface supplies generally adequate, but drought can cause shortages of water for power generation and municipal use.

MIDWEST—Shortages chiefly for industrial and municipal use.

CHICAGO—Overpumping and declining water levels. Yield will decline gradually for a long time.

PEORIA—Situation critical.

INDIANAPOLIS—Improved over early 1940's.

CINCINNATI AREA—Overdeveloped and levels stabilized at low stages. Trouble would result if withdrawal increased substantially.

OHIO—Mahoning River most intensively used in state. Also most polluted stream in U. S. Used in manufacture of 10 pct of finished steel output. In Dec. 1949 the entire flow was reused over 10 times resulting in temperatures approaching 140 degrees F. and reduced quality. Sewage treatment plants won't be effective unless temperature is reduced.

SOUTHWEST—Increasing use for irrigation causing considerable overdraft on available supplies.

WEST—Irrigation major use of water, but industrial uses are increasing. Readily available surface water supplies already appropriated, hence increased use of ground water.

All is not black, however. The Geological Survey says that "with adequate hydrologic investigation critical water shortages in most communities in the future can be met by making appropriate analysis of need and designing systems on the basis of dependable long-term yield of water sources. Present water shortages are due almost exclusively to failure in the past to make adequate hydrologic studies as a basis for planning."

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No Scrap Expected When Subcommittees Discuss Problems

Washington—Herman D. Moskowitz, past president of the Institute of Scrap Iron & Steel Inc. and vice-president of the Schiavone-Bonomo Corp., Jersey City, N. J., has been appointed chairman of a special committee of the Scrap Institute to meet with a subcommittee of the scrap committee of the American Iron & Steel Institute to consider mutual problems.

Stanley M. Kaplan, president of the Institute and vice-president of

the M. S. Kaplan Co., Chicago, also named other members of this special committee. These include Joel Claster, of Luria Bros. & Co., Philadelphia, and Darwin S. Luntz, of the Luntz Iron & Steel Co., Canton, Ohio, both also past presidents of the Institute; William Pohn, president of the Chicago chapter and president of the

Pohn Iron & Steel Co., Chicago; and Benjamin Schwartz, of the Benjamin Schwartz Co., New York, a former director general of the Institute. Mr. Kaplan will also serve on the committee.

The two committees representing the scrap and steel industries will meet in New York late this month.

AIME Meeting Most Extensive To Date

Many subjects covered in 70 technical sessions . . . D. H. McLaughlin made 1950 president . . . Gold Medal Awards presented to nine experts.

New York—The 79th annual meeting of the American Institute of Mining and Metallurgical Engineers ended today (Thursday) with a series of interesting technical sessions on the making of steel by the bessemer process. They were preceded earlier by the Howe Memorial Lecture delivered by Francis B. Foley of the International Nickel Co. on the subject, "Factors Affecting Deformation and Rupture of Metals at Elevated Temperatures."

More than 3000 AIME members attended the meetings held at the Hotel Statler, which started Sunday, Feb. 12 and continued for 5 days. This year's program was the most extensive yet. More than 70 technical and economic sessions were held and 290 technical papers were delivered during the course of the meetings.

On Sunday the Institute of Metals Div. of the AIME discussed the problems arising out of the change of metals from the liquid to solid state, with particular interest given to the solidification of steel ingots.

ECA Minerals Director Speaks

Features of the Monday morning technical sessions were papers delivered on the production of aluminum from clay and a discussion as to what should be done to further the application of geophysics, geochemistry and geology to the mining industry. A welcoming lunch-



L. E. Young



D. H. McLaughlin

eon sponsored by the New York Local Section, AIME, was given in honor of Fred. V. Seibert, president of the Canadian Institute of Mining and Metallurgy. At an economic session later in the day, Charles H. Burgess, Strategic Minerals Director of ECA, spoke on "The Pattern of the ECA."

Col. E. C. Thompson of the Texas Railroad Commission lead off Tuesday's Petroleum Session on production economics with a paper on "Proration and Its Application to the Conservation of Oil and Gas." Other speakers in the session discussed the recent past and foreseeable future of production from the engineering and research point of view.

At the annual banquet Wednesday evening, Donald H. McLaughlin, president of Homestead Mining Co., Lead, S. D., was formally inducted as AIME's 1950 president. Prior to the induction, the retiring president, L. E. Young, Pittsburgh consulting engineer, made



the following AIME Gold Medal Awards for 1950:

Charles F. Rand Medal for outstanding efforts in nonferrous field, to Francis H. Brownell, former chairman Amer. Smelting & Refining Co.

James Douglass Medal, for distinguished contribution in field of Aluminum, to Francis C. Frary, research dir., Aluminum Co. of America, New Kensington, Pa.

William Lawrence Saunders Medal, for leadership in coal mining industry, to Howard N. Eavenson, consulting engineer, Pittsburgh, Pa.

Anthony F. Lucas Medal, for achievement and leadership in petroleum geology, to William Embry Wrather, dir. of geology, U. S. Geological Survey, Washington, D. C.

Erskine Ramsey Medal, for outstanding work in coal mechanization, to Paul Weir, Chicago.

Robert W. Raymond Memorial Award, to Walter R. Hibbard, Jr., for his paper on "Plastic Deformation for Large Grained Copper Specimens."

Robert H. Richards Award, to Arthur F. Taggart, for outstanding contributions to progress of mineral beneficiation.

Robert W. Hunt Award, to John S. Marsh, of Bethlehem Steel Corp., for his paper on "Operation of Oxygen Enriched Open Hearth Furnaces."

Institute of Metals Division Award, to Morris Cohen and William Harris, for their paper on "Stabilization of Austenite Martensite Transformation."

Singer Aids French Affiliate

Washington — Singer Manufacturing Co. will lend its affiliated French company, La Singer Compagnie, the sum of \$600,000 under a Marshall Plan guarantee that this sum, plus earnings of \$117,000, can be converted into dollars.

JET SCHOOL: An instructor in General Electric's jet school at Lynn, Mass., points out a design detail on a turbojet to students attending one of the training courses which the company conducts. Fort Knox, wartime nickname of the nation's first jet engine test cell, enables the students, from the military services and the aviation industry, to study the J-47 in test operation.

GE Twin Drive Ordered For Ohio Cold Strip Mill

Schenectady — A General Electric twin drive unit has been ordered to meet an unusual application on a cold reduction mill for the Cold Metal Products Co., Youngstown, O. Designed to handle specialty steel and chrome alloy products, the new unit will be installed in the near future.

GE Supplies Complete System

The GE twin motor drive, consisting of two 100-hp, 460 to 500-rpm, 219-v motors, will be directly connected to the backup rolls of a four-high reversing cold strip mill, and will provide a maximum strip speed of 1800 fpm. This is an unusual application since the normal drive is to the work rolls of a cold strip mill instead of the backup rolls.

Each reel drive will have two identical 75-hp motors arranged for tandem connection by a clutch mechanism. One motor will be used for rolling with light tensions, and both motors for rolling with heavier tensions. The reel motors will have a speed range of 150 to 450 rpm, and will be directly connected to the reels.

ASME Panel Discusses Influence of Consumer Demands

Milwaukee — The influence of customer demands and suggestions on the design and performance of capital goods machinery was the subject for a double panel discussion at Milwaukee, Feb. 8, sponsored by the machine design section of the American Society of Mechanical Engineers.

Capital goods buyers have a good grasp of their requirements, and are in a position to make constructive design and performance suggestions to machine builders' design engineers. Design requirements or suggestions come most freely from buyers of single purpose machines and from large buyers such as the automotive industry, panel members said. Such suggestions and demands stimulate machine design development.

Study Shows Coal Users Switching to Other Fuels

Washington — Obviously disturbed by the increasing unstable coal production, conversion to other fuels for power production is progressing at record rates among both public utility and private industrial facilities.

Increased Capacity

Coal consumption for power generation dropped 15.6 pct last year while use of fuel oil and gas for the same purpose increased 55.5 and 15 pct, respectively, according to the Federal Power Commission's annual report for 1949.

At the same time, both types of producers increased capacity by a combined total of 6.4 million kw to bring the nation's overall potential output to 76.1 million kw.

Statistically, combined industrial and utility electric power production set a new record of 344 billion kwh including 53.5 billion kwh by industrial facilities and 89.7 billion kwh produced from water power.

Use of coal in 1949 totaled 84.1 million tons, compared with 99.5 million in 1948. Fuel oil use increased from about 43 million to 66.3 million barrels while gas consumption rose by about 71 billion cu ft to 549 billion.

Caterpillar Tractor Sales Reached New High During '49

Peoria—Sales of the Caterpillar Tractor Co. reached an all-time high level in 1949, exceeding 1948 by over \$36 million. Profits were almost \$19 million, up more than \$5 million over 1948. Compared to 1948, Caterpillar's employees increased from 21,638 to 22,795, and total payments to employees increased \$5.5 million to \$77 million.

The sales outlook for 1950 continues to be generally favorable, President Neumiller told stockholders. He said Caterpillar's prices were stable during 1949, and were not expected to fall below present levels in the near future.

BACK TO SCHOOL: It's back to school for these three SKF Industries, Inc., employees as the ball and roller bearing firm, in a unique industrial relations experiment, makes after-hours education courses available to workers in its Philadelphia plants. More than 200 employees—7 pct of the work force—are voluntarily enrolled in eight classes.



Bureau of Mines Tells How To Recover Titanium from Ore

Washington—Methods of recovering titanium and iron minerals from the waste products of Arkansas bauxite ore are described in a recent Bureau of Mines report.

In extracting alumina from bauxite ores through a modified Bayer process at an industrial plant at Bauxite, Ark., 80,000 tons of black sands and 392,500 tons of brown mud are discarded each year as waste, according to information in the report.

Bureau tests proved that about 100 tons of marketable iron ore and about 45 tons of low-grade ilmenite concentrates could be recovered from the black sands each day.

Quality Control Course Offered

Washington—Washington U. will present its annual course in quality control, Apr. 17-29. The course offers advanced training in management techniques. Particular emphasis will be given to quality control methods useful in the foundry, chemical, paper, leather, ceramic and rubber industries.

Seek to Continue Law On Copper Import Duty Suspension

Washington—Increasing demands for copper ore by fabricators and the need for stockpiling make the continued suspension of import duty on copper a necessity, Representative Patterson, R., Conn., declared recently.

May Become Taxable July 1

Copper imports, exempt from duty since early in World War II, will again become taxable on July 1 unless Congress acts to extend the present exemption. Western congressmen, opposed to any further extension of the present exemption law, are determined to defeat proposals to permit duty-free copper to come into the U. S.

Mr. Patterson maintains that an insufficient amount of copper ore is mined domestically to supply the U. S. market. "The reimposition of import taxes would necessitate a rise in the costs of production of copper products and those containing copper," he states. "This procedure would be of no benefit to American producers, and would instead impose a price burden on consumers of copper products."

Viewing the News from

The ECONOMIC SIDE

By JOSEPH STAGG LAWRENCE

"A Lesson in Capitalist Economics"

NOTHING illustrates the changing context of economics more strikingly than the oil industry. Two years ago the outlook for the industry was painted by sober investment counselors and oil experts in the brilliant hues of a Maxfield Parrish pastel.

The world was suffering from an acute shortage of fuels. The most desirable of all energy sources—crude oil—existed under the earth's surface in limited quantities. Every time a new barrel of crude was found, the unknown but limited remainder was reduced by just that much.

Over a period of two decades, the use of petroleum increased at an annual rate of 4½ pct. This compared with a rate of 2 pct for all energy sources. The use of coal, thanks to that great salesman of all substitute fuels, John L. Lewis, remained stationary.

To the oil statistician and investment adviser, this all added up to the growing scarcity of a national resource no less vital to our economy in peace than in war. From the point of view of the investor, oil had three other superlative advantages.

In the first place, it enjoyed special tax treatment, approached in some other industries but nowhere equalled. The very costly effort to find oil and bring it to the surface, "intangible drilling costs," may be charged to income. Furthermore, a depletion charge, equal to 27½ pct of gross earnings, can be deducted from earnings for tax purposes.

In the second place, the labor factor in oil production is low. In the cost pattern of the average integrated oil company, labor outlay may account for one fifth of the total. This compares with two thirds for nonferrous metal mining, and one half for railroads.

Finally, oil is "something in the ground." As deficit financing continues and the dollar loses its value, the price of oil will maintain a stable market place value.

This bright prospect has changed. It has changed largely because the world has underestimated its oil resources and its capacity to deliver "block gold" to points of need.

During the past 10 years the production of oil outside the United States has doubled. Canada has tripled her production. Within the next 5 years she will be completely self-sustaining in oil and may become a net exporter. The Middle East had quadrupled its output during this period. It is a major contributor to the current daily flow of 850,000 bbl coming into this country from abroad.

Even with the vigorous growth in the consumption of gasoline, fuel oil, and other petroleum products, this cataract of black fluid is exerting enormous pressure on the market price of oil. In an effort to hold the dike against a price drop the Texas Railroad Commission has cut oil production to 17 days per month. California has lowered production 10 pct; Oklahoma, 8 pct.

On top of all this, the British Government has recently placed an embargo on all fuel oil coming from dollar areas and reduced gasoline imports by a third.

In spite of all the foregoing, most shrewd investors are hanging on to their oil stocks. Over a longer period of time they still seem to be good bets. The current change in the oil picture merely illustrates again the manner in which an economic prospect can be transformed almost overnight in spite of the best intelligence and the most careful logic. It also illustrates again that crises in free economics often develop from an over-abundance of goods, whereas crises in dictatorships usually mean famine, purges, or war.

Industry Leaders Push First Earthmoving Conference

Peoria—The first conference devoted exclusively to the earthmoving industry will be held in Peoria, Ill., April 11 and 12. The meeting is sponsored by the Central Illinois section of the Society of Automotive Engineers. Invitations have been sent to 2000 men representing manufacturers and suppliers of earthmoving equipment in the North Central States area.

Well Known Author to Speak

Speakers at technical sessions will be Robert Bourne, Colorado Fuel & Iron Co.; Emil Norelius, Allis-Chalmers Mfg. Co.; R. M. Schaefer, General Motors Corp., and G. J. Storatz, Heil Co. Banquet speakers will be R. G. LeTourneau, president, R. G. LeTourneau Co., and William Hazlitt Upson, author of the well known "Earthworm Tractor" stories.

Dealer Franchises Issued For Stud Welding Equipment

Cleveland—Dealer franchises for the rental, sale and service of stud welding equipment are being issued to established welding equipment dealers under a new policy announced by Leonard C. Barr, vice-president and general sales manager of the Nelson Stud Welding Div. of Morton Gregory Corp.

The announcement coincided with the issuance of franchises to the first 25 dealers, all of whom will have stud welding guns available for rental by the day, week or month, as well as for outright purchase. They will also carry standard gun parts and accessories.

Chain Mfg. Adds Another Link

Cleveland—Cleveland Chain & Mfg. Co. has formed a new company, Round Chain & Mfg. Co., with headquarters in Chicago, which will be directly connected with five other Round Chain plants, including the Cleveland firm, which produces chains of all types.

Govt. Stockpiling Falls Behind Schedule

Completion of program may cost \$1.3 billion more than original estimate. . . . Lagging due to lack of funds and scarcity of some material.

Washington — Study and revision of the nation's stockpiling requirements, underway for the past few months, will be completed some time this spring. Munition Board sources say unofficially that completion of the program may cost nearer \$4.5 billion than the original estimate of \$3.2 billion.

Addition of aluminum and asbestos to the stockpiling list, plus revision of estimates of needs for 11 items on the critical list, has already boosted the probable cost to about \$3.8 billion.

In its annual report to Congress, the Board said that after 3½ years of stockpiling only about 41.5 pct of the total needed was on hand or on order as of Dec. 31. The completion percentage is expected to rise to 54 pct by June 30.

Needs Revised for 11 Materials

The report blamed the lagging program partly to the inadequacy of funds to buy surpluses and partly to scarcity of some items.

The 11 materials for which needs have been revised are metallurgical manganese, metallurgical chromite, tin, rubber, abaca, sisal, corundum, kyanite, quebracho, talc and opium. These items represent about a third of the proposed stockpile dollar volume.

Addition of aluminum to the list was first recommended by the Aluminum & Magnesium Industry Advisory Board in 1947. Recommendations were made again in 1948 and 1949. Stockpiling was approved by the Board last November.

But steps had been taken to stockpile aluminum before it was officially added to the list. Both Reynolds and Kaiser (Permanente) had effected agreements with the government whereby they could pay off part of their obligations for surplus war plants with aluminum instead of cash. Permanente last December arranged to buy four of the

plants it now operates under lease for approximately \$50 million.

Marshall Plan operations have added \$20 million worth of rubber, mica, bauxite, industrial diamonds, beryl, cryolite, lead and zinc to the stockpile. Agreements are pending for some \$32 million more.

Rubber Quantities Low

Beneficiation of war surplus transfers is well under way, the report said. This includes refining of copper, lead and zinc scrap to stockpile specifications. Repacking of mercury in sound flasks is about completed.

Also, on transfer to government warehouses last year of a large tonnage of stockpiled rubber, it was found that quantities were now below stockpile standards. Replacement is now being effected and research is being undertaken to lengthen the rotation cycle which is now relatively short.

Three tank farms are scheduled

for completion this year. They will be capable of holding half the planned stockpile of sperm, coconut, palm and castor oil, now stored in commercial leased space.

Govt. Storage Space Plentiful

The government now has plenty of storage space for stockpiling procurements through this year and next — 166 sites within the continental United States and one in Alaska. About half of these are storage sites leased from private industry but transfer to government sites continues. Stockpiled rubber has already been transferred from 65 commercial warehouses, leaving stocks at 37 still to be transferred and checked this year.

Four government war surplus facilities have been renovated for storage purposes and two more will be ready by June with two additional ones earmarked for similar use.

Boiler and Tank Equipment Purchased by Rheem Mfg. Co.

Wheeling, W. Va.—Rheem Manufacturing Co., producer of heavy home appliances and steel shipping containers, has purchased the equipment and inventory of the Wheeling Steel Corp.'s range boiler and tank plant, Portsmouth, O.

Rheem will continue to make the Whitaker range boiler line at its Chicago and Sparrows Point plants. The company operates seven other plants in the United States and has subsidiaries in South America, Canada and other countries.

Wheeling has continued to make range boilers and tanks at Portsmouth since the sale of that plant to Portsmouth Steel in 1946. Detroit Steel Corp. recently purchased the Portsmouth company and will probably use the space presently occupied by the range boiler and tank operations.

K. P. Fuhrmann and other key personnel of the boiler and tank division will be associated with Rheem.

"Everything's been going wrong today!"



Construction Steel News

Fabricated steel awards this week included the following:

1800 Tons, Lane Co., Ore., bridge superstructures for two lower river overflow crossings, lower main river crossing and a highway underpass structure on Southern Pacific R.R. and Oregon State Highway 58 relocation, Lookout Point Reservoir, Portland District Corps of Engineers, CIVENG-35-026-50-181, to American Bridge Co., Portland, Ore.

900 Tons, Green Bay, Wis., two buildings for Northern Paper Co., to Worden-Allen Co., Milwaukee.

545 Tons, Reading and Woburn, Mass., seven bridges and bituminous concrete surfacing, Route 128 Circumferential Highway, to Lane Construction Co., Meriden, Conn.

325 Tons, White Plains Hospital, White Plains, N. Y., to Grand Iron Works, New York.

280 Tons, Two Rivers, Wis., warehouse, to Joseph T. Ryerson and Son, Chicago.

275 Tons, Lincoln, Nebr., J. C. Penney store building, to Lincoln Steel Works, Lincoln, Nebr.

236 Tons, Williamsport, Pa., additional to hospital, to Bethlehem Steel Co., Bethlehem.

225 Tons, Caribou, Maine, power station for Maine Public Service Co., through Stone and Webster Engineering Corp., Boston, to Haarman Steel Co., Holyoke, Mass.

158 Tons, Hagerstown, Md., Homewood Church Home, through O. H. Hostetter, Hanover, Pa., to Maryland Machine & Foundry Co., Hagerstown, Md.

109 Tons, Crestline, Ohio, engine house repair, for Pennsylvania Railroad, to American Bridge Co., Pittsburgh.

Fabricated steel inquiries this week included the following:

6269 Tons, Cumberland and Dauphin Counties, Pa., construction of a 27-span deck plate

girder I-beam and a reinforced concrete T-beam bridge, over the Susquehanna River between Wormleysburg Borough and the city of Harrisburg, State Highway and Bridge Authority, Harrisburg, Pa. Bids to Mar. 17.

1800 Tons, Kansas City, Kans., parts depot for International Harvester Co.

573 Tons, Burlington and Lexington, Mass., limited access state highway, Northern Circumferential Highway, Route 128, five bridges, Fred D. Sabin, Cambridge, Mass., district engineer.

556 Tons, Reading and Woburn, Mass., seven bridges and bituminous concrete.

400 Tons, Lemont, Ill., Argonne Laboratory, Atomic Energy Commission, The Austin Co., Contractors.

340 Tons, Winnebago County, Ill., State of Illinois bridge section 75F.

200 Tons, Hinsdale, Ill., school auditorium.

117 Tons, Bergen County, N. J., New Jersey Dept. of Highways, Route 4(5b1), due Mar. 2.

Reinforcing bar awards this week included the following:

4275 Tons, Chicago, apartment building at 1330 Lake Shore Drive, S. N. Nielsen Co., Chicago, contractor, to Bethlehem Steel Co.

935 Tons, Covington, Ky., flood protection walls, to Truscon Steel Co., Cleveland.

800 Tons, Reading and Woburn, Mass., seven bridges and bituminous concrete surfacing, Route 128, to Lane Construction Co., Meriden, Conn.

765 Tons, Minneapolis, Livestock Coliseum, to Truscon Steel Co., Cleveland.

580 Tons, Chicago, warehouse for Admiral Corp., to Jos. T. Ryerson and Son, Chicago.

490 Tons, Cleveland, Tuberculosis Hospital, to Paterson-Leitch Co., Cleveland.

350 Tons, Tucson, Ariz., sewage disposal plant, through M. M. Sundt, Tucson, to Truscon Steel Co.

270 Tons, Rochester, Minn., Surgical Hospital,

to U. S. Steel Supply Co., Chicago.

250 Tons, Los Angeles, Law School building, University of California at Los Angeles, through R. J. Daum Construction Co., Ingewood, to Truscon Steel Co.

230 Tons, Minneapolis, University of Minnesota classroom building, to Bethlehem Steel Co.

195 Tons, Chicago, J. C. Penney store to Jos. T. Ryerson and Son, Chicago.

170 Tons, Rochester, Minn., hospital, to Cere Steel Products Corp., Chicago.

160 Tons, Cook County, Ill., State Highway bridge 42VB-12, to U. S. Steel Supply Co., Chicago.

125 Tons, Cook County, Ill., State Highway bridge 42VB-10, to U. S. Steel Supply Co., Chicago.

105 Tons, Burlington, Mass., two bridges and bituminous concrete surfacing, Route 128. Completion date Nov. 30, 1950, to Lane Construction Co., Meriden, Conn.

100 Tons, Moorhead, Minn., water works, to Paper Calmenson Co., St. Paul.

Reinforcing bar inquiries this week included the following:

1800 Tons, Milwaukee, sewage disposal plant.

696 Tons, Reading and Woburn, Mass., seven bridges and bituminous construction.

330 Tons, Gary, Ind., Budd Mfg. Co. plant.

320 Tons, Cumberland and Dauphin Counties, Pa., construction of a 27-span deck plate girder I-beam and a reinforced concrete T-beam bridge, over the Susquehanna River between Wormleysburg Borough and the city of Harrisburg, State Highway and Bridge Authority, Harrisburg, Pa. Bids to March 17.

267 Tons, Waltham and Lexington, Mass., limited access highway, two bridges, Fred D. Sabin, Cambridge, Mass., district engineer. Completion date, Dec. 1, 1950.

220 Tons, Skokie, Ill., Eden S Parkway overpass.

Some Items Added, Some Removed From Export Controls

Washington—Effective Feb. 9, prefabricated steel houses, some industry machinery, a number of coal tar products and industrial chemicals have been removed from the export control positive list. They may be shipped to any destination in any quantity without a license.

At the same time, items from seven groups of industrial equipment, including excavating and conveying machinery, were added to the positive list and require licenses for shipment to any foreign country except Canada. Both lists are detailed in current Export Bulletin 565.

Major items removed included steel prefabs, coal sorting machines, fourdrinier wire and cloth, flexible guard rails, certain types of power capacitors, varied communications devices, and varied chemicals. Also, switchboard panels, watt meters, audio amplifying apparatus and parts, and other electrical items.

Among the items added to the list were mechanical coal cleaning devices, jigs and washers, types of magnetic pulleys and drums, certain electrostatic precipitators, air conditioning and refrigeration equipment and parts, and larger types of electromagnetic and electrostatic separators, components and parts.

Building Contracts Drop

New York—Contracts awarded for building and heavy engineering works in the 37 states east of the Rocky Mountains during January amounted to \$730,855,000, the F. W. Dodge Corp. reports. This is a drop of 21 pct from December and an increase of 51 pct over January of last year.

Non-residential contracts amounted to \$235,294,000, a decline of 22 pct from December. All major non-residential classifications except social and recreational building were below December's total.

Residential contract volume amounted to \$343,501,000 last

month. This represented an 18 pct decline from December and a 116 pct gain over Jan. '49.

PBS Approves 149 New Government Building Projects

Washington—The Public Buildings Service has approved 149 government building projects, bringing the pending total to 462. Sites will be purchased shortly and construction plans prepared.

This leaves the PBS with 113 locations to go under a \$40 million appropriation by the last Congress (Public Law 105) covering site buying and plan preparation for 575 proposed buildings.

Most of the sites approved and being acquired are for new post offices. Also included in the list are courthouses, customs houses, postal garages, public health service hospitals and quarantine stations.

Cost of the projects range from about \$200,000 for post offices at Halifax, Va., and Luverne, Minn., to \$6.7 million for a barge office at New York City.

Briefs and Bulletins

full speed ahead—The decision of many firms to pull out all the stops in the race for high production despite critical coal stocks was influenced by quick government action in the coal crisis late last week. The temporary restraining order against the strike appears to have weakened John L. Lewis' strangle-hold on industry. At the same time it issued the restraining order, the Federal Court ordered a hearing on Feb. 20 to decide whether a Taft-Hartley injunction shall be issued. Such an injunction could restrain the union for a total of 80 days.

out of coal—Wheeling Steel Corp. has shut down its Benwood, W. Va., plant, including the steel works and all production departments. Coke output at Steubenville East Works, previously reduced, was cut to 25 pct, necessitating reduction of blast furnace operations to one furnace at Steubenville North Works and curtailing openhearth output to about 60 pct of capacity. Rolling and finishing mills were on a reduced basis.

inland curtails—Inland steel company shut down another blast furnace last week. A blast furnace was shut down in January and another is down for repairs. This leaves five of eight furnaces operating. By charging more scrap in its openhearts the company hopes to hold its drop in steel output to 5-6 pct.

birmingham cutback—With four of its nine blast furnaces out of production, the Tennessee Coal & Iron Co. is keeping the usual number of openhearts on, spreading out the hot metal as best it can. Republic Steel may operate at 90 pct of capacity in this area, despite a slowdown in coke operations.

cutback—Sharon Steel Corp. banked one blast furnace at Farrel Works last week and cutback the second to 75 pct wind. The furnace at Lowellville also was on 75 pct wind. Openhearth operations are good for at least another week.

down—Republic Steel Corp. has two blast furnaces down at Youngstown and is operating 18 of 22 openhearts. Further curtailments are in prospect unless coal is received this week.

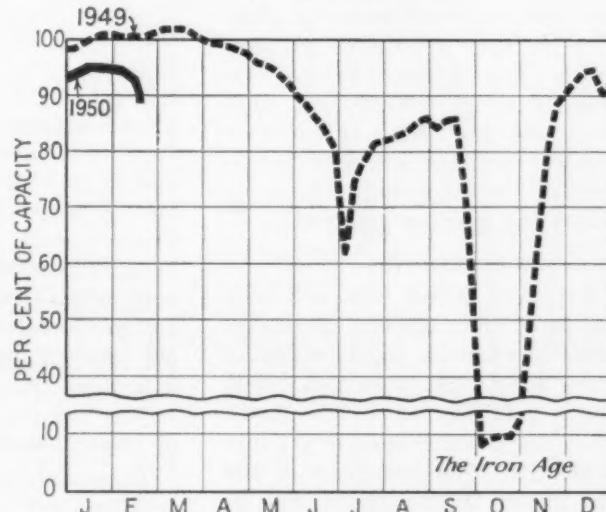
freight cars—Domestic freight car deliveries during January totaled 2395, according to the American Railway Car Institute. This compares with 3330 in December and 8913 in January, 1949. Orders during January totaled 9385. New orders for the entire year of 1949 totaled 6248. The backlog of orders Feb. 1 was 19,026, compared with 12,036 on Jan. 1 and 96,464 Feb. 1, 1949.

feedback—Auto companies are feeding back a considerable amount of steel to their suppliers. This will have to be expanded as steel deliveries are set back. There has already been some backing up on deliveries and this is expected to increase as more facilities are put out of operation by the coal shortage.

conversion—Conversion tonnages into May are being planned. Most of this is by auto makers, but there is some participation by appliance and farm equipment industries. Some steel companies are expected to process conversion ingots even if the coal crisis forces blast furnaces down.

expansion—United Engineering and Foundry Co., Pittsburgh, will begin an expansion program at its Canton plant. The project will cost between \$600,000 and \$700,000 and is scheduled for completion late this year.

Steel Operations



District Operating Rates—Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
February 5.....	97.0*	100.5*	88.5*	79.0	98.0*	101.5	102.5	96.0	103.0*	87.0	82.5	87.0	96.0	91.0
February 12.....	97.5	98.5	78.0	79.0	92.0	101.5	89.0	82.0	101.0	89.0	80.0	77.5	98.5	89.0

* Revised.

Nonferrous METALS OUTLOOK

Market Activities

Alcoa's new Texas reduction plant goes into production . . .

Reynolds adds two potlines at Jones Mills . . . Threat of prolonged coal strike cuts into metal markets.

by

John Anthony



New York—Last week the Aluminum Co. of America put into operation its new ingot reduction plant at Point Comfort, Tex. (THE IRON AGE, May 27, 1948, p. 132) which will have a total capacity of 55,000 short tons of aluminum a year. Capacity operation of the new plant will add 9 pct to effective national aluminum capacity which, with present power supplies, is set at 605,000 tons. Last week only one of the three Point Comfort potlines was put in operation. The others will go into operation as soon as practicable.

Powered by Diesels

Reynolds Metals Co. will also add to effective national aluminum capacity when its third potline at Jones Mills, Ark., goes into operation in February, and in late March when the fourth potline is put into production. The reopening of the two Jones Mills potlines will be made possible by the completion of the Lake Catherine power plant of the Arkansas Power & Light Co. This development will add nearly 6 pct to effective national aluminum capacity with an additional 36,000 tons of annual capacity at Jones Mills.

The opening of the Alcoa reduc-

NONFERROUS METALS PRICES

	Feb. 8	Feb. 9	Feb. 10	Feb. 11	Feb. 13	Feb. 14
Copper, electro, Conn.	18.50	18.50	18.50	18.50	18.50	18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Straits, New York	74.50	74.50	74.50	74.50	74.50	74.50
Zinc, East St. Louis	9.75	9.75	9.75	9.75	9.75	9.75
Lead, St. Louis	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.

tion plant at Point Comfort is significant because it is the first peace-time reduction plant installation making use of other than hydroelectric power sources. The Point Comfort plant, located on the Gulf Coast, will be powered by 120 Nordberg diesel engines. Two of the potlines at Jones Mills are powered by internal combustion engines. The other two potlines have heretofore had no economical source of power available to them.

These developments will provide an effective U. S. capacity for aluminum of 696,000 short tons a year.

Coal Strike Affects Metals

The prospect of a prolonged coal strike has begun to make its effect felt on the metal markets, particularly in the case of zinc. But shipments of zinc in January, 82,576

short tons including government and export shipments, as reported by the American Zinc Institute, were higher than in any month last year. This rate of shipments may be compared with the monthly average in 1949 of 66,395 tons. January production, 69,948 tons, was significantly lower than December's 71,327 tons, and lower than the 72,509 tons monthly average for 1949.

Toward the latter part of last week the copper market also began to show the result of fear that there would be growing shortages of steel due to the prolonged coal strike. Daily sales from Wednesday on were much lower than heretofore. But orders placed for February delivery totaled about 85,000 tons by the end of the week. Orders for March delivery were close to 50,000 tons.

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)
Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.6¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 2S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.082 in., 2S, 2S, 29.5¢; 4S, 61S-O, 32.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: 1/4 in., and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 64¢; 11 to 13, 34.6¢ to 76¢; 23 to 26, 36.7¢ to 81.0¢; 35 to 37, 44¢ to \$1.50; 47 to 49, 63.5¢ to \$2.20.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 38.5¢ to 32¢.

Screw Machine Stock: Rounds, 11S-T3, R317-T4; 1/4 to 11/32 in., 49¢ to 38¢; 5/16 to 1/2 in., 37.5¢ to 35.5¢; 19/32 to 19/16 in., 35.5¢ to 32.5¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 36¢ to 26.5¢; 52S, 44¢ to 32¢; 56S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T-6, 76¢ to 56¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed)
Sheets and Plate: Ma, FSA, 1/4 in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-81.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, diam in., 1/4 to 0.311, 58¢; 3/4 to 1/2 in., 46¢; 1 1/4 to 1.749, 48¢; 2 1/2 to 6, 41¢. Other alloys higher. Base: Up to 1/4 in. diam, 10,000 lb; 1/4 in. to 1 1/4 in., 20,000 lb; 1 1/4 in. and larger, 30,000 lb.

Extruded Square, Hex, Bar: M, size across flats, in., 1/4 to 0.311, 61¢; 3/4 to 0.749, 48¢; 1 1/4 to 1.749, 44¢; 2 1/2 to 4, 42¢. Other alloys higher. Base: Up to 1/4 in. diam, 10,000 lb; 1/4 in. to 1 1/4 in., 20,000 lb; 1 1/4 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangle: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 2.5 in., 55¢ to 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 in., 10,000 lb; 1/2 lb to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, 1/4 to 5/16, 31.14; 5/16 to 1/2, 1/2 to 5/8, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, 1/2 to 7/16, 86¢; 1/2 to 5/8, 62¢; 1 to 2 in., 57¢; 0.165 to 0.219, 1/2 to 3/4, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher. Base, OD in in.: Up to 1 1/4 in., 10,000 lb; 1 1/4 in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and bars	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks	40	

Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	32.18	31.78	
Copper, h-r	28.03	28.03	28.03
Copper, drawn	29.28		
Low brass	30.12	29.81	33.03*
Yellow brass	28.69	28.38	31.70*
Red brass	30.60	30.29	33.51*
Naval brass	33.51	27.57	28.82
Laded brass	25.19	27.22	
Com'l bronze	31.61	31.30	34.27*
Manganese bronze	37.01	30.92	32.42
Phosphor bronze	50.90	51.15	
Muntz metal	31.58	27.14	28.39
Everdur, Her-culoy, Olym-pic, etc.	37.19	36.14	
Nickel silver, 10 pct	39.66	41.87	46.80
Arch. bronze			27.22
*Seamless tubing			

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	27.25
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$25.00
Bismuth, ton lots	32.00
Cadmium, del'd	32.00
Cobalt, 97-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	18.50
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$100 to \$110
Lead, St. Louis	11.80
Lead, New York	12.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, 100 to 5000 lb	36¢ to 38¢
Mercury, dollars per 76-lb flask f.o.b. New York	\$70 to \$73
Nickel, electro, f.o.b. New York	42.97
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$66 to \$69
Silver, New York, cents per oz.	73.25
Tin, New York	74.50
Zinc, East St. Louis	9.75
Zinc, New York	10.47
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1/4¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

Copper	Heavy	Turnings
	15 1/2	14 3/4
Yellow brass	12 1/2	11 3/4
Red brass	14	13 1/4
Commercial bronze	14 1/4	13 1/2
Manganese bronze	12	11 1/4
Leaded brass rod ends	12 1/2	...

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	15.50
No. 2 copper wire	14.50
Light copper	13.50
No. 1 composition	12.75
No. 1 comp. turnings	12.25
Rolled brass	10.75
Brass pipe	11.00
Radiators	9.75

*Dry copper content

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire	15.50
No. 2 copper wire	14.50
Light copper	13.50
No. 1 composition	12.75
No. 1 comp. turnings	12.25
Rolled brass	10.75
Brass pipe	11.00
Radiators	9.75
Heavy yellow brass	Aluminum
Mixed old cast	10.00-10.50
Mixed old clips	9.75-10.00
Mixed turnings, dry	7.00-7.50
Pots and pans	9.75-10.00
Low copper	11.50-12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	
No. 1 heavy copper and wire	14-14 1/2
No. 2 heavy copper and wire	13-13 1/2
Light copper	11 1/2-12
Auto radiators (unsweated)	8 1/2-8 1/2
No. 1 composition	11-11 1/2
No. 1 composition turnings	10 1/2-10 1/2
Clean red car boxes	9-9 1/2
Cocks and faucets	9-9 1/2
Mixed heavy yellow brass	7 1/4-7 1/2
Old rolled brass	8 1/2-8 1/2
Brass pipe	9 1/2-9 1/2
New soft brass clippings	10 1/2-11
Brass rod ends	9 3/4-10
No. 1 brass rod turnings	9 1/2-9 1/2

Aluminum

Alum. pistons and struts	4 1/2-5
Aluminum crankcases	7-7 1/2
2S aluminum clippings	10 1/2-11
Old sheet and utensils	7-7 1/2
Borings and turnings	4
Misc. cast aluminum	7-7 1/2
Dural clips (24S)	7-7 1/2

Zinc

New zinc clippings	6 1/2-7
Old zinc	4-4 1/2
Zinc routings	2 1/2-3
Old die cast scrap	3 1/4-3 1/2

Nickel and Monel

Pure nickel clippings	21-23
Clean nickel turnings	14-15
Nickel anodes	20-22
Nickel rod ends	20-22
New Monel clippings	12-14
Clean Monel turnings	8-9
Old sheet Monel	10-12
Old Monel castings	9-10
Inconel clippings	11-13
Nickel silver clippings, mixed	8-10
Nickel silver turnings, mixed	6-7

Lead

Soft scrap, lead	9 1/2-9 1/2
Battery plates (dry)	4 1/2-4 1/2

Magnesium

Segregated solids	9-10
Castings	5 1/2-6 1/2

Miscellaneous

Block tin	60-62
No. 1 pewter	38-40
No. 1 auto babbitt	35-37
Mixed common babbitt	9-9 1/4
Solder joints	11 1/2-12
Siphon tops	40-42
Small foundry type	11 1/2-12
Monotype	10 1/2-11
Lino. and stereotype	9 1/4-10 1/4
Electrotype	8 1/2-8 1/2
New type shell cuttings	11 1/2-11 1/2
Hand picked type shells	4-4 1/2
Lino. and stereo. dross	4 3/4-5
Electro. dross	2 1/2-3



SCRAP

Iron & Steel

Market Catches Jitters From Coal Trouble

The uncertain coal situation dominated the whole scrap market early this week. Any surge that the coal shortage might have made in turnings prices has pretty well passed. Mills are at the point where they couldn't buy any more turnings now and still get them shipped in time to make any difference. Within a week they will be cutting back sharply unless the coal strike is settled.

The same holds true of open-hearth grades. The recent strength in this material was due largely to extra tonnage needed to increase the scrap charge in open-hearths. Most of this business has also passed, though some of the orders are still being filled.

Meanwhile the foundry demand for cast iron is not up to past performance. With the exception of Pittsburgh where some heavy breakable was bought to sweeten openhearth charges, cast was generally weak in tone. Prices dropped at Chicago, Philadelphia and New York.

Until the coal picture is clear there is not much scrap business expected. Once that is settled steel-making scrap demand promises to be quite firm for at least the first half of the year.

PITTSBURGH—The market undertone was weak. Brokers are still buying No. 1 steel at \$31 but the trade was not too sure another sale could be closed at \$31.50. With the outlook for coal certain, there was little activity. A sale of No. 2 heavy melting at \$29 represented a decline of 50¢ on that grade. Heavy turnings were up \$1 to \$28. Railroad specialties were up 50¢, and heavy breakable cast jumped \$2 to \$32.

CHICAGO—Pricewise the market remained quiet here last week. Blast furnace grades continued to be the most active item as a result of the coal situation. The increased mill buying of last week turned out to be disappointing and has not been strong enough to materially influence the market for heavy melting steel, though a few speculative broker purchases at higher than the going consumer price were noted, and some similar purchases are evident in railroad scrap items. Most of the dealers are still finding bundles virtually unsalable, the mill orders which establish current prices being limited to a few dealers, with rigid inspection prevailing.

PHILADELPHIA—Some business is still being placed here, but on a very limited scale. What business there is in steel grades is going on the basis of previous quotations. Some criticism has developed in dealer circles over the resistance of one consumer to buying in this market. Dealer stocks continue very heavy under the circumstances, and are generally overbalanced with bundles. Weakness continues in the cast market due to the foundry strike here. Heavy breakable is down by \$1.50 to \$2. No. 1 machinery is down \$1. Malleable and carwheels are quoted \$1 lower. Rails are weaker, and quoted \$1 lower.

NEW YORK—The market opened the week in the doldrums with most buyers waiting for the coal strike to clear up. It is too late to worry about turnings for blast furnaces and the tendency to increase cast charges in the openhearth is not being reflected here. Shoveling turnings were off 50¢ and cast grades were weaker across the board. District foundries are crying the blues and have knocked as much as \$2 a ton off their buying prices.

DETROIT—The local scrap market continues on the dull side. Sales are very light. Until the coal strike is settled no test of the market is likely to occur in the opinion of local sources. The Chrysler strike has already shortened appreciably the supply of No. 1 bundles. Some sources say this is an important factor in future market conditions.

CLEVELAND—A confused and spotty market was developing here and in the valley this week. Some mills are revising shipment schedules downward on openhearth grades. On the other hand, there is a demand for cast grades for openhearts which, coupled with foundry requirements, is making for a strong cast market. The turnings market is firm, but prices are off somewhat from last week. Blast furnaces remaining in operation are being pushed to the limit, which is keeping the turnings moving. Tonnages in dealers' yards are pressing harder.

ST. LOUIS—Two steel mills came into the market for an estimated 20,000 to 25,000 tons of No. 2 heavy melting steel, at \$1 a ton below the preceding purchases. The material is for delivery within the next 30 days. All outstanding orders had terminated on Feb. 10. The new orders were placed with local dealers. Malleable and standard steel car axles were higher on demand from other markets. Louisville & Nashville R.R. has a list of 600 tons.

BOSTON—Early this week the coal impasse dried up what little dickering there was here on steelmaking scrap and the trade has adopted a wait and see attitude—which is nothing new here. The prices now quoted for cast grades are those at which sales would have been made early this week, if there were any sales. There weren't. Cast business is now standing still.

BUFFALO—General uncertainty swept the market as sharp reductions in ingot operations were anticipated if miners stay out this week. Cast prices slipped \$1 a ton. Business in cast was light but leading sellers expressed a willingness to do business at the reduced range of \$31-32 for cupola material.

CINCINNATI—Cast grades are strong in a soft market here. Demand for cast for openhearth furnaces has tightened up the market for the foundry grades and drop broken and short rail are quotable this week at a top of \$42 and \$43 respectively. Turnings for the blast furnace are moving at quoted prices and settlement of the coal situation is likely to mean a pickup in No. 1 heavy melting. No. 2 bundles and No. 2 steel are dormant at the amount.

BIRMINGHAM—On the basis of limited tonnages bought by Republic Steel Corp., openhearth grades of steel have dropped \$2 in this district. The market is very dull generally with little demand being shown for any type of material.

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*Based on approximate resale
prices, Jan. 1st, 1950

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In Cone-Drive you can also get the triple
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Division, Michigan Tool Company
7171 E. McNichols Road • Detroit 12, Michigan

MANUFACTURED BY MICHIGAN TOOL COMPANY

Pittsburgh

No. 1 hvy. melting	\$31.00 to \$31.50
No. 2 hvy. melting	28.50 to 29.50
No. 1 bundles	31.00 to 31.50
No. 2 bundles	23.50 to 24.00
Machine shop turn.	21.00 to 21.50
Mixed bor. and ms. turns.	21.00 to 21.50
Shoveling turnings	24.50 to 25.00
Cast iron borings	24.50 to 25.00
Low. phos. plate	32.00 to 32.50
Heavy turnings	27.00 to 28.00
No. 1 RR. hvy. melting	32.50 to 33.00
Scrap rails, random lgth.	35.50 to 36.50
Rails 2 ft and under	39.00 to 40.00
RR. steel wheels	35.00 to 35.50
RR. spring steel	35.00 to 35.50
RR. couplers and knuckles	35.00 to 35.50
No. 1 machinery cast	37.00 to 38.00
Mixed yard cast	34.00 to 35.00
Heavy breakable cast	31.00 to 32.00
Malleable	33.00 to 34.00

Chicago

No. 1 hvy. melting	\$27.00 to \$28.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 factory bundles	27.00 to 28.00
No. 1 dealers' bundles	26.00 to 28.00
No. 2 dealers' bundles	24.00 to 26.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	19.00 to 20.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	20.50 to 21.50
Low phos. forge crops	31.00 to 33.00
Low phos. plate	29.00 to 31.00
No. 1 RR. hvy. melting	29.00 to 30.00
Scrap rails, random lgth.	33.00 to 34.00
Rerolling rails	40.00 to 41.00
Rails 2 ft and under	39.00 to 40.00
Locomotive tires, cut	33.00 to 34.00
Cut bolsters & side frames	34.00 to 35.00
Angles and splice bars	35.00 to 36.00
RR. steel car axles	42.00 to 43.00
RR. couplers and knuckles	32.00 to 33.00
No. 1 machinery cast	38.00 to 39.00
No. 1 agricul. cast	37.00 to 38.00
Heavy breakable cast	30.00 to 31.00
RR. grate bars	29.00 to 30.00
Cast iron brake shoes	30.00 to 31.00
Cast iron car wheels	36.00 to 37.00
Malleable	36.00 to 37.00

Philadelphia

No. 1 hvy. melting	\$22.50 to \$23.50
No. 2 hvy. melting	20.50 to 21.50
No. 1 bundles	22.50 to 23.50
No. 2 bundles	17.50 to 18.50
Machine shop turn.	16.00 to 16.50
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	17.00 to 17.50
Low phos. punchings, plate	25.50 to 26.50
Low phos. 5 ft and under	24.50 to 25.50
Low phos. bundles	24.50 to 25.50
Hvy. axle forge turn.	22.50 to 23.50
Clean cast chem. borings	28.00 to 29.00
RR. steel wheels	28.00 to 29.00
RR. spring steel	28.00 to 29.00
Rails 18 in. and under	36.00 to 37.00
No. 1 machinery cast	35.00 to 36.00
Mixed yard cast	30.00 to 31.00
Heavy breakable cast	31.50 to 32.00
Cast iron carwheels	36.00 to 37.00
Malleable	36.00 to 37.00

Cleveland

No. 1 hvy. melting	\$28.00 to \$28.50
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	28.00 to 28.50
No. 1 bundles	28.00 to 28.50
No. 2 bundles	22.50 to 23.00
Machine shop turn.	18.50 to 19.00
Mixed bor. and turn.	20.50 to 21.00
Shoveling turnings	20.50 to 21.00
Cast iron borings	20.50 to 21.00
Low phos. 2 ft and under	29.00 to 29.50
Steel axle turn.	27.00 to 27.50
Drop forge flashings	28.00 to 28.50
No. 1 RR. hvy. melting	32.00 to 32.50
Rails 3 ft and under	42.00 to 43.00
Rails 18 in. and under	43.00 to 44.00
No. 1 machinery cast	42.00 to 43.00
RR. cast	42.00 to 43.00
RR. grate bars	30.00 to 31.00
Stove plate	34.00 to 35.00
Malleable	38.00 to 39.00

Youngstown

No. 1 hvy. melting	\$30.50 to \$31.00
No. 2 hvy. melting	27.50 to 28.00
No. 1 bundles	30.50 to 31.00

Scrap IRON & STEEL Prices

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$24.50 to \$25.00
Machine shop turn.	21.00 to 21.50
Shoveling turnings	23.00 to 23.50
Cast iron borings	23.00 to 23.50

Low phos. plate 31.50 to 32.00

Buffalo

No. 1 hvy. melting	\$27.50 to \$28.00
No. 2 hvy. melting	25.50 to 26.00
No. 1 busheling	25.50 to 26.00
No. 1 bundles	26.50 to 27.00
No. 2 bundles	24.00 to 24.50
Machine shop turn.	18.00 to 18.50
Mixed bor. and turn.	19.00 to 19.50
Shoveling turnings	20.50 to 21.00
Cast iron borings	19.50 to 20.00
Low phos. plate	29.00 to 29.50
Scrap rails, random lgth.	33.50 to 34.00
Rails 2 ft and under	38.50 to 39.00
RR. steel wheels	33.00 to 33.50
RR. spring steel	33.00 to 33.50
RR. couplers and knuckles	33.00 to 33.50
No. 1 machinery cast	35.00 to 36.00
No. 1 cupola cast	31.00 to 32.00
Stove plate	32.50 to 33.00
Small indus. malleable	30.00 to 30.50

Birmingham

No. 1 hvy. melting	\$23.00
No. 2 hvy. melting	22.00
No. 2 bundles	20.00
No. 1 busheling	22.00
Machine shop turn.	\$16.00 to 17.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00
Bar crops and plate	27.00 to 28.00
Structural and plate	27.00 to 28.00
No. 1 RR. hvy. melt	25.00 to 26.00
Scrap rails, random lgth.	29.00 to 30.00
Rerolling rails	33.00 to 34.50
Rails 2 ft and under	35.50 to 36.00
Angles & splice bars	34.00 to 35.00
Std. steel axles	28.00 to 29.00
No. 1 cupola cast	34.00 to 35.00
Stove plate	29.00
Cast iron carwheels	28.00 to 29.00

St. Louis

No. 1 hvy. melting	\$29.00 to \$30.00
No. 2 hvy. melting	24.00 to 25.00
No. 2 bundled sheets	24.00 to 25.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	18.00 to 19.00
Rails, random lengths	30.00 to 31.00
Rails 3 ft and under	35.00 to 36.00
Locomotive tires, uncut	27.00 to 28.00
Angles and splice bars	34.00 to 35.00
Std. steel car axles	39.00 to 41.00
RR. spring steel	30.00 to 31.00
No. 1 machinery cast	36.00 to 37.00
Hvy. breakable cast	29.00 to 30.00
Cast iron brake shoes	27.00 to 28.00
Cast iron car wheels	34.00 to 35.00
Malleable	31.00 to 33.00

New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$20.25 to \$20.75
No. 2 hvy. melting	17.50 to 18.00
No. 2 bundles	16.00 to 16.50
Machine shop turn.	10.50 to 11.00
Mixed bor. and turn.	10.50 to 11.00
Shoveling turnings	11.00 to 11.50
Clean cast chem. bor.	23.00 to 24.00
No. 1 machinery cast	26.50 to 27.00
Mixed yard cast	24.50 to 25.00
Charging box cast	24.50 to 25.00
Heavy breakable cast	24.50 to 25.00
Unstrp. motor blocks	20.00 to 21.00

Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$18.50 to \$19.50
No. 2 hvy. melting	15.50 to 16.00
No. 1 bundles	18.50 to 19.50

No. 2 bundles	\$14.00 to \$14.50
Machine shop turn.	9.50 to 10.00
Mixed bor. and turn.	9.50 to 10.00
Shoveling turnings	12.00 to 12.50
No. 1 busheling	16.50 to 17.00
Clean cast chem. borings	18.00 to 18.50
No. 1 machinery cast	25.50 to 27.00
No. 2 machinery cast	21.00 to 22.00
Heavy breakable cast	21.00 to 22.00
Stove plate	21.00 to 22.00

Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	22.00 to 23.00
New busheling	21.00 to 22.00
Flashings	21.00 to 22.00
Machine shop turn.	14.00 to 14.50
Mixed bor. and turn.	14.00 to 14.50
Shoveling turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Low phos. plate	22.00 to 23.00
No. 1 cupola cast	31.00 to 32.00
Heavy breakable cast	25.00 to 26.00
Stove plate	26.00 to 27.00
Automotive cast	34.00 to 35.00

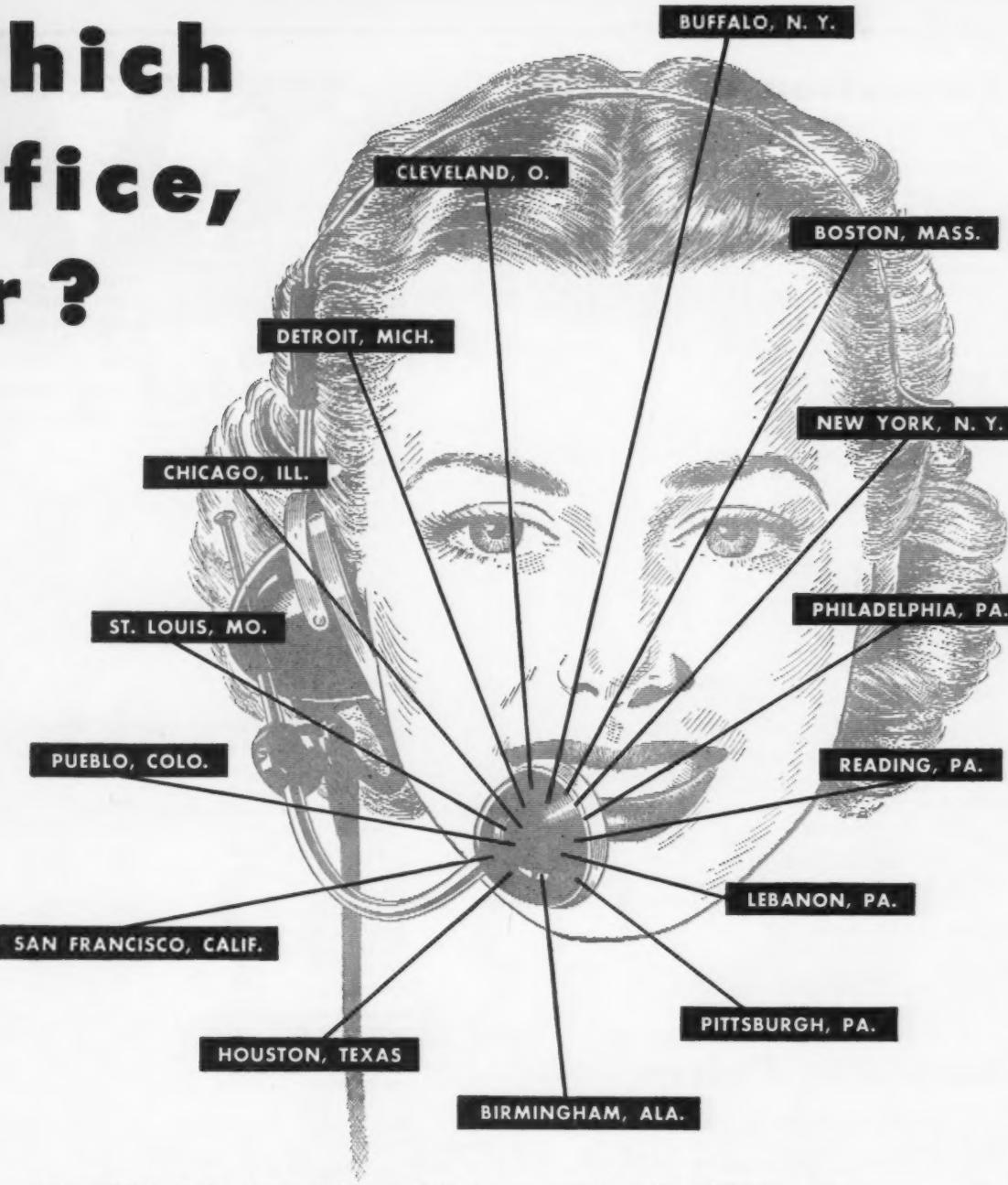
Cincinnati

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$25.50 to \$26.00
No. 2 hvy. melting	21.50 to 22.00
No. 1 bundles	25.50 to 26.00
No. 2 bundles	17.50 to 18.00
Machine shop turn.	12.50 to 13.00
Mixed bor. and turn.	13.50 to 14.00
Shoveling turnings	15.50 to 16.00
Cast iron borings	15.50 to 16.00
Low phos. 18 in. under	32.00 to 32.50
Rails, random lengths	32.00 to 33.00
Rails, 18 in. and under	42.00 to 43.00
No. 1 cupola cast	35.00 to 36.00
Hvy. breakable cast	31.00 to 32.00
Drop broken cast	41.00 to 42.00

San Francisco

No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bundles	16.00
No. 2 bundles	16.00
No. 3 bundles	13.00

Which office, sir?



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Feb. 14,	Feb. 7,	Jan. 17,	Feb. 15,
(cents per pound)	1950	1950	1950	1949
Hot-rolled sheets	3.35	3.35	3.35	3.26
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.265
Cold-rolled strip	4.21	4.21	4.21	4.063
Plates	3.50	3.50	3.50	3.42
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25

Tin and Terneplate:

(dollars per base box)

Tinplate (1.50 lb) cokes .	\$7.50	\$7.50	\$7.50	\$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. ternes	6.50	6.50	6.50	6.65

Bars and Shapes:

(cents per pound)

Merchant bars	3.45	3.45	3.45	3.37
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50

Wire:

(cents per pound)

Bright wire	4.50	4.50	4.50	4.256
Rails:				
(dollars per 100 lb)				

Heavy rails	\$3.40	\$3.40	\$3.40	\$3.20
Light rails	3.75	3.75	3.75	3.55

Semifinished Steel:

(dollars per net ton)

Rerolling billets	\$54.00	\$54.00	\$54.00	\$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00

Wire Rod and Skelp:

(cents per pound)

Wire rods	3.85	3.85	3.85	3.619
Skelp	3.15	3.15	3.15	3.25

Prices advances over previous week are printed in Heavy Type; declines appear in Italics.

Pig Iron:	Feb. 14,	Feb. 7,	Jan. 17,	Feb. 15,
(per gross ton)	1950	1950	1950	1949
No. 2, foundry, Phila.	\$50.42	\$50.42	\$50.42	\$51.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	47.08	49.46
No. 2, Birmingham	42.38	42.38	40.38	43.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	49.92	49.92	49.92	50.76
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese‡	173.40	173.40	173.40	161.40

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

‡Average of U. S. prices quoted on Ferroalloy page.

Scrap:

(per gross tons)

Heavy melt'g steel, P'gh	\$31.25	\$31.25	\$29.75	\$38.75
Heavy melt'g steel, Phila.	23.00	23.00	23.00	39.50
Heavy melt'g steel, Ch'go	27.50	27.50	26.50	34.50
No. 1 hy. com. sh't, Det.	23.50	23.50	23.50	32.50
Low phos. Young'n	31.75	31.75	30.75	45.25
No. 1, cast, Pittsburgh	37.50	37.50	37.50	57.50
No. 1, cast, Philadelphia	35.50	37.00	37.00	46.00
No. 1, cast, Chicago	38.50	38.50	38.50	42.00

Coke: Connellsburg:

(per net ton at oven)

Furnace coke, prompt...	\$14.00	\$14.00	\$14.00	\$15.25
Foundry coke, prompt...	15.75	15.75	15.75	16.75

Nonferrous Metals:

(cents per pound to large buyers)

Copper, electro, Conn.	18.50	18.50	18.50	23.50
Copper, Lake Conn.	18.625	18.625	18.625	23.625
Tin Straits, New York	74.50	74.50	76.25	\$1.08
Zinc, East St. Louis	9.75	9.75	9.75	17.50
Lead, St. Louis	11.80	11.80	11.80	21.30
Aluminum, virgin	17.00	17.00	17.00	17.00
Nickel electrolytic	42.97	42.97	42.97	42.90
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	27.25	27.25	28.75	38.50

Starting with the issue of May 12, 1940, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1940, issue.)

Composite Prices

Finished Steel Base Price

Feb 14, 1950.....	3.837¢ per lb.....
One week ago	3.837¢ per lb.....
One month ago	3.837¢ per lb.....
One year ago	3.717¢ per lb.....

High

1950..... 3.837¢ Jan. 3 3.837¢ Jan. 3

1949..... 3.837¢ Dec. 27 3.705¢ May 3

1948..... 3.721¢ July 27 3.193¢ Jan. 1

1947..... 3.193¢ July 29 2.848¢ Jan. 1

1946..... 2.848¢ Dec. 31 2.464¢ Jan. 1

1945..... 2.464¢ May 29 2.396¢ Jan. 1

1944..... 2.396¢ 2.396¢

1943..... 2.396¢ 2.396¢

1942..... 2.396¢ 2.396¢

1941..... 2.396¢ 2.396¢

1940..... 2.30467¢ Jan. 2 2.24107¢ April 16

1939..... 2.35367¢ Jan. 3 2.26689¢ May 16

1938..... 2.58414¢ Jan. 4 2.27207¢ Oct. 18

1937..... 2.58414¢ Mar. 9 2.32263¢ Jan. 4

1936..... 2.32263¢ Dec. 28 2.05200¢ Mar. 10

1935..... 2.07642¢ Oct. 1 2.06492¢ Jan. 8

1932..... 1.89196¢ July 5 1.83901¢ Mar. 1

1929..... 2.31773¢ May 28 2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

High	Low	High	Low
\$46.38 Feb. 7	\$45.88 Jan. 3	\$27.25 Feb. 7	\$26.25 Jan. 3
46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10
23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8
Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.			
Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.			

ated
Feb. 15,
1949
\$51.56
46.50
49.46
43.38
46.50
50.76
46.00
46.50
46.50
73.78
161.40
the Chi-

\$38.75
39.50
34.50
32.50
45.25
57.50
46.00
42.00

\$15.25
16.75

23.50
23.625
\$1.03
17.50
21.30
17.00
42.90
20.50
38.50

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Jan. 3
June 28
Mar. 9
May 20
Jan. 1
May 22
Oct. 24
17
17
Apr. 10
Apr. 9
May 16
June 7
June 9
June 8
Apr. 29
July 5
Dec. 8
melting
sumers
and Chi-

1950

ALTER

A NAME TO REMEMBER IN . . .

STAINLESS STEEL

SCRAP

AND ALL GRADES OF NICKEL AND ALLOY SCRAP

Cast Iron
Electric Furnace Grades
Open Hearth
Foundry Steel
Sheet Iron for Baling
Stainless Steel
Non-Ferrous Metals

Over 50 Years
ALTER
C O M P A N Y

1700 ROCKINGHAM ROAD DAVENPORT 2, IOWA

IRON AGE STEEL PRICES	Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page. Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply													
	Pittsburgh	Chicago	Gary	Cleveland	Canton-Ma- cillion	Middle- town	Youngs- town	Bethle- hem	Buffalo	Consho- hocken	Johns- town	Spar- rows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	\$50.00													\$50.00 81
Alley net ton	\$51.00													\$51.00 81
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	\$53.00	\$53.00	\$53.00				\$57.00		\$53.00	\$58.00	\$53.00			
Carbon forging billets, net ton	\$63.00	\$63.00	\$63.00	\$63.00			\$63.00		\$63.00	\$65.00	\$63.00			\$63.00 81
Alloy, net ton	\$66.00	\$66.00	\$66.00		\$66.00		\$66.00	\$66.00	\$66.00	\$68.00	\$66.00			\$66.00 81
SHEET BARS							\$57.00							
PIPE SKELP	3.15						3.15							
WIRE RODS	3.85	3.85	3.85	3.85			3.85				3.85	3.85		
SHEETS Hot-rolled (18 ga. & hvr.)	3.35	3.35	3.35	3.35			3.35		3.35	3.45		3.35		3.55 81
Cold-rolled	4.10^{1.5}		4.10	4.10		4.10	4.10		4.10			4.10	4.30	4.30 81
Galvanized (10 gage)	4.40		4.40		4.40		4.65⁶⁴ 4.75⁴⁴					4.40		
Enameling (12 gage)	4.40		4.40	4.40		4.40	4.40⁶ 4.90⁷⁶					4.60	4.70	
Long tones (10 gage)	4.80			4.80		4.80	4.80							
Hi Str. low alloy, h.r.	5.05	5.05	5.05	5.05			5.05		5.05	5.05		5.05		5.25 81
Hi Str. low alloy, c.r.	6.20		6.20	6.20			6.20		6.20			6.20		6.40 81
Hi Str. low alloy, galv.	6.75											6.75		
STRIP Hot-rolled (over 6 in.)	3.25	3.25	3.25	3.25			3.25		3.25	3.35		3.25		3.45 81
Cold-rolled	4.15	4.30	4.30	4.15		4.15	4.15		4.15			4.15		4.40 ^{6.81} 4.35 ^{15.47}
Hi Str. low alloy, h.r.	4.95		4.95	4.95			4.95		4.95	4.95		4.95		5.15 81
Hi Str. low alloy, c.r.	6.20			6.20			6.20		6.20			6.20		6.40 81
TINPLATE† Cokes, 1.50-lb. base box 1.25 lb. deduct 20¢	\$7.50		\$7.50				\$7.50					\$7.80	\$7.70	
Electrolytic 0.25, 0.50, 0.75 lb box														
Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price														
BLACKPLATE, 29 gage Hollowware enameling	5.30		5.30				5.30					5.40	5.50	
BARS Carbon steel	3.45	3.45	3.45	3.45	3.45		3.45		3.45		3.45			3.65 81
Reinforcing‡	3.45	3.45	3.45	3.45			3.45		3.45		3.45	3.45		
Cold-finished	4.10⁵ 4.15^{2.4}	4.15²	4.15	4.15	4.15		4.15		4.15					4.45 81
Alloy, hot-rolled	3.95	3.95	3.95		3.95		3.95		3.95	3.95		3.95		4.25 81
Alloy, cold-drawn	4.90	4.90	4.90	4.90	4.90		4.90		4.90	4.90				
Hi Str. low alloy, h.r.	5.20		5.20	5.20			5.20		5.20	5.20		5.20		5.40 81
PLATE Carbon Steel	3.50	3.50	3.50	3.50			3.50		3.50	3.60	3.50	3.50		3.75 81
Floor plates	4.55	4.55	4.55	4.55						4.55				
Allo	4.40	4.40	4.40				4.40			4.40	4.40	4.40		
Hi Str. low alloy	5.35	5.35	5.35	5.35			5.35			5.35	5.35	5.35		5.50 81
SHAPES, Structural	3.40	3.40	3.40					3.45	3.45		3.45			
Hi Str. low alloy	5.15	5.15	5.15				5.15		5.15	5.15		5.15		
MANUFACTURERS' WIRE Bright	4.50	4.50²		4.50			4.50		Kokomo = 4.60³⁰		4.50	4.60		Duluth = 4.50 ² Pueblo = 4.75 ¹⁴
PILING, Steel sheet	4.20^{1.9}	4.20							4.20					

Smaller numbers indicate producing companies. See key at right.
Prices are in cents per lb unless otherwise noted. Extras apply.

WEST COAST Seattle, San Francisco, Los Angeles, Fontana			
Kansas City	Houston	Birm- ingham	
\$50.00 88			
\$53.00 11	F=\$72.00 ¹⁹		
\$71.00 88	\$63.00 11	F=\$82.00 ¹⁹	Geneva=\$61.00 ¹⁶
\$74.00 88		F=\$85.00 ¹⁹	Portsmouth=\$55.00 ²⁰
4.25 88	3.85 11	SF=4.50 ²⁴ , LA=4.65 ²⁴ LA=4.20 ²²	Portsmouth=3.85 ²⁰ Worcester=4.15 ²
3.35 4.11		SF, LA=4.05 ²⁴ F=4.25 ¹⁹	Ashland ⁷ =3.35 Niles=3.50 ²⁴
4.10 11		SF=5.05 ²⁴ F=5.00 ¹⁹	
4.40 4.11		SF, LA=5.15 ²⁴	Ashland=4.40 ⁷ Kokomo=4.50 ²⁰
5.05 11		F=6.74 ¹⁹	
		F=7.05 ¹⁹	
3.85 88	3.65 88	3.25 11	SF, LA=4.00 ²⁴ , 62 F=4.40 ¹⁹ , S=4.25 ²²
			Ashland=3.25 ⁷ Atlanta=3.40 ⁶⁵
			F=5.40 ¹⁹ LA=5.50 ²⁷
			New Haven=4.65 ² , 68
4.95 11		F=6.84 ¹⁹	
		F=6.95 ¹⁹	
57.00 11		SF=\$8.25 ²⁴	
Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price			
4.05 88	3.85 88	3.45 4.11	SF, LA=4.15 ²⁴ LA=4.15 ²²
4.05 88	3.85 88	3.45 4.11	SF, S=4.20 ²⁴ F=4.10 ¹⁹
			Atlanta=3.80 ⁶⁵
			Atlanta=3.80 ⁶⁵
			Putnam, Newark=4.55 ²⁰
4.65 88	4.35 88		LA=5.00 ⁶² F=4.95 ¹⁹
			Newark, ⁶⁹ Worcester ² =5.20 Hartford=5.20 ⁴
		5.20	F=6.25 ¹⁹
3.90 88	3.50 4.11		F=4.10 ¹⁹ S=4.40 ⁶² Geneva=3.50 ¹⁶
			Claymont=3.80 ²⁹ Coatesville=3.80 ²¹ Harrisburg=3.50 ²⁵
			Harrisburg=4.55 ²⁵
			F=5.40 ¹⁹
			Coatesville=4.50 ²¹
		5.35 11	F=5.95 ¹⁹
			Geneva=5.35 ¹⁶
4.00 88	3.80 88	3.40 11	SF=3.95 ⁶² LA=4.00, 24, 62
			Phoenixville=3.30 ⁶⁸ Geneva=3.40 ¹⁶
		5.15 11	F=4.00 ¹⁹ S=4.05 ⁶²
5.10 88	4.90 88	4.50 4.11	SF, LA=5.45 ²⁴ LA=5.10 ⁶²
			Portsmouth=4.50 ²⁰ Worcester=4.80 ²

Notes: ¹Special coated mfg ternes, deduct \$1.00 from 1.50-lb coke base box price.
Can-making quality blackplate, 55 to 128-lb, deduct \$1.90 from 1.50-lb coke base box.
²Straight lengths only from producer to fabricator.

IRON AGE

STEEL PRICES

KEY TO STEEL PRODUCERS

With Principal Offices

- Carnegie-Illinois Steel Corp., Pittsburgh
- American Steel & Wire Co., Cleveland
- Bethlehem Steel Co., Bethlehem
- Republic Steel Corp., Cleveland
- Jones & Laughlin Steel Corp., Pittsburgh
- Youngstown Sheet & Tube Co., Youngstown
- Armco Steel Corp., Middletown, Ohio
- Inland Steel Co., Chicago
- Weirton Steel Co., Weirton, W. Va.
- National Tube Co., Pittsburgh
- Tennessee Coal, Iron & R. R. Co., Birmingham
- Great Lakes Steel Corp., Detroit
- Sharon Steel Corp., Sharon, Pa.
- Colorado Fuel & Iron Corp., Denver
- Wheeling Steel Corp., Wheeling, W. Va.
- Geneva Steel Co., Salt Lake City
- Crucible Steel Co. of America, New York
- Pittsburgh Steel Co., Pittsburgh
- Kaiser Co., Inc., Oakland, Calif.
- Portsmouth Steel Corp., Portsmouth, Ohio
- Lukens Steel Co., Coatesville, Pa.
- Granite City Steel Co., Granite City, Ill.
- Wisconsin Steel Co., South Chicago, Ill.
- Columbia Steel Co., San Francisco
- Copperweld Steel Co., Glassport, Pa.
- Alan Wood Steel Co., Conshohocken, Pa.
- Calif. Cold Rolled Steel Corp., Los Angeles
- Allegheny Ludlum Steel Corp., Pittsburgh
- Worth Steel Co., Claymont, Del.
- Continental Steel Corp., Kokomo, Ind.
- Rotary Electric Steel Co., Detroit
- Laclede Steel Co., St. Louis
- Northwestern Steel & Wire Co., Sterling, Ill.
- Keystone Steel & Wire Co., Peoria, Ill.
- Central Iron & Steel Co., Harrisburg, Pa.
- Carpenter Steel Co., Reading, Pa.
- Eastern Stainless Steel Corp., Baltimore
- Washington Steel Corp., Washington, Pa.
- Jessop Steel Co., Washington, Pa.
- Blair Strip Steel Co., New Castle, Pa.
- Superior Steel Corp., Carnegie, Pa.
- Timken Steel & Tube Div., Canton, Ohio
- Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- Reeves Steel & Mfg. Co., Dover, Ohio
- John A. Roebling's Sons Co., Trenton, N. J.
- Simonds Saw & Steel Co., Fitchburg, Mass.
- McLouth Steel Corp., Detroit
- Cold Metal Products Co., Youngstown
- Thomas Steel Co., Warren, Ohio
- Wilson Steel & Wire Co., Chicago
- Sweet's Steel Co., Williamsport, Pa.
- Superior Drawn Steel Co., Monaca, Pa.
- Tremont Nail Co., Wareham, Mass.
- Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
- Ingersoll Steel Div., Chicago
- Phoenix Iron & Steel Co., Phoenixville, Pa.
- Fitzsimmons Steel Co., Youngstown
- Stanley Works, New Britain, Conn.
- Universal-Cyclops Steel Corp., Bridgeville, Pa.
- American Cladmetals Co., Carnegie, Pa.
- Cuyahoga Steel & Wire Co., Cleveland
- Bethlehem Pacific Coast Steel Corp., San Francisco
- Follansbee Steel Corp., Pittsburgh
- Niles Rolling Mill Co., Niles, Ohio
- Atlantic Steel Co., Atlanta
- Acme Steel Co., Chicago
- Joslyn Mfg. & Supply Co., Chicago
- Detroit Steel Corp., Detroit
- Wykoff Steel Co., Pittsburgh
- Bliss & Laughlin, Inc., Harvey, Ill.
- Columbia Steel & Shafting Co., Pittsburgh
- Cumberland Steel Co., Cumberland, Md.
- La Salle Steel Co., Chicago
- Monarch Steel Co., Inc., Indianapolis
- Empire Steel Co., Mansfield, Ohio
- Mahoning Valley Steel Co., Niles, Ohio
- Oliver Iron & Steel Co., Pittsburgh
- Pittsburgh Screw & Bolt Co., Pittsburgh
- Standard Forgings Corp., Chicago
- Driver Harris Co., Harrison, N. J.
- Detroit Tube & Steel Div., Detroit
- Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- Sheffield Steel Corp., Kansas City

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column Pittsburg, Calif.
Standard & coated nails*	106 125 $\frac{1}{2}$
Woven wire fence†	116 139
Fence posts, carloads†	116
Single loop bale ties	113 137
Galvanized barbed wire**	126 146
Twisted barbless wire	126 146

* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15 $\frac{1}{2}$ gauge and heavier. ** On 80 rod spools, in carloads. †† Duluth, Joliet; Johnstown, 112.

	Base per Pittsburg, 100 lb Calif.
Merch. wire, annealed†	\$5.35 \$6.30
Merch. wire, galv.t.	5.60 6.55
Cut nails, carloads†	6.75 ...

† Add 30¢ at Worcester; 20¢ at Chicago; 10¢ at Sparrows Pt. † Less 20¢ to jobbers. § Torrance, 126.

PRODUCING POINTS — Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Alquippa, Pa. (except bale ties), 5; Bartontonville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 2; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 2; Kokomo, Ind., 30; Minnequa, Colo., 14; Monessen, Pa. (except bale ties), 18; Pittsburgh, Calif., 24; Portsmouth, Ohio, 20; Rankin, Pa. (except bale ties), 2; Sparrows Point (except woven fence), 3; Sterling, Ill., 33; San Francisco (except nails and woven fence), 14; Torrance, Calif. (nails only), 24; Worcester (nails only), 2; Houston (except bale ties), 83; Kansas City, 83.

Fence posts: Duluth, 2; Johnstown, Pa., 3; Joliet, Ill., 2; Minnequa, Colo., 14; Moline, Ill., 4; Williamsport, Pa., 51.

Cut nails: Wheeling, W. Va., 15; Conshohocken, Pa., 26; Wareham, Mass., 53.

CLAD STEEL

	Base prices, cents per pound, f.o.b. mill
Stainless-carbon	Plate Sheet
No. 304, 20 pct.	
Coatesville, Pa. (21)	26.50
Washington, Pa. (39)	26.50
Claymont, Del. (29)	26.50
Conshohocken, Pa. (26)	22.50
New Castle, Ind. (55)	26.50 24.00
Nickel-carbon	
10 pct, Coatesville (26)	27.50
Inconel-carbon	
10 pct, Coatesville (21)	36.00
Monel-carbon	
10 pct, Coatesville (21)	29.00
No. 302 Stainless-copper-stainless, Carnegie, Pa. (60)	75.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)	7.75

* Includes annealing and pickling, or sandblasting.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	6.45
Electrical	6.95
Motor	7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS — Beech bottom, W. Va., 18; Brackenridge, Pa., 28; Hollansbee, W. Va., 63; Granite City, Ill., 22 $\frac{1}{2}$; add 20¢; Indiana Harbor, Ind., 8 $\frac{1}{2}$; deduct 25¢; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7 $\frac{1}{2}$; deduct 25¢.

Numbers after producing points correspond to steel producers. See key on Steel Price page.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago) Base discount

Machine and Carriage Bolts

	Pct Off List	Less	Case C.
1/2 in. & smaller x 6 in. & shorter	27 38		
9/16 & 5/8 in. x 6 in. & shorter	29 40		
3/4 in. & larger x 6 in. shorter	26 37		
All diam., longer than 6 in.	22 34		
Lag, all diam over 6 in. & longer	28 39		
Lag, all diam x 6 in. & shorter	30 41		
Flow bolts	40		

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

	25	37
1/2 in. and smaller	25	37
9/16 and 5/8 in.	23	35
3/4 to 1 1/2 in., inclusive	23	35
1 1/2 in. and larger	16	29

Semifinished Hexagon Nuts

(Less case lots)

	Pct Off List	Reg	Hvy	Lt
1/2 in. and smaller	41	35	41	
9/16 & 5/8 in.	36	30	36	
3/4 to 1 1/2 in.	31	27	33	
1 1/2 in. and larger	21	17		

In full case lots, 15 pct additional discount.

Stove Bolts

Packaged, steel, plain finish 63 $\frac{1}{2}$ and 10 Bulk, plain finish 50 and 10

* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5,000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

** Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Large Rivets

(1/2 in. and larger)
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa. \$7.25

Small Rivets

(7/16 in. and smaller)
Pct Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 43

Cap and Set Screws

(In bulk) Pct Off List

Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 1/2 in. x 6 in., SAE 1020, bright	60
1/4 in. through 5/8 in. x 6 in. and shorter (SAE 1035) heat treated	54
Milled studs	28
Flat head cap screws, listed sizes	24
Flat head cap, listed sizes	48

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon	4.15¢
0.41 to 0.60 carbon	5.95¢
0.61 to 0.80 carbon	6.55¢
0.81 to 1.05 carbon	8.50¢
1.06 to 1.35 carbon	10.80¢

Worcester, add 0.30¢.

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports) Per gross ton

Old range, bessemer	\$8.10
Old range, nonbessemer	7.95
Mesabi, bessemer	7.85
Mesabi, nonbessemer	7.70
High phosphorus	7.70

After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier.

No. 1 quality, per 100 lb \$3.40

Joint bars, per 100 lb 4.40

Light rails, per 100 lb 3.75

Base Price

cents per lb

Track spikes 5.60

Axles 6.25

Screw spikes 8.60

Tie plates 4.20

Tie plates, Pittsburgh, Torr., Calif. 4.35

Track bolts, untreated 8.85

Track bolts, heat treated, to railroads 9.10

* Seattle, add 30¢.

† Kansas City, 5.85¢.

PRODUCING POINTS — Standard rails: Bessemer, Pa., 1; Emsley, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Minnequa, Colo., 14; Steelton, Pa., 3.

Light rails: All the above except Indiana Harbor and Steelton, plus Fairfield, Ala., 11; Johnstown, Pa., 3; Minnequa, Colo., 14.

Joint bars: Bessemer, Pa., 1; Fairfield, Ala., 11; Indiana Harbor, Ind., 8; Joliet, Ill., 1; Lackawanna, N. Y., 3; Steelton, Pa., 3; Minnequa, Colo., 14.

Track spikes: Fairfield, Ala., 11; Indiana Harbor, Ind., 6, 8; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 5; Chicago, 4; Struthers, Ohio, 6; Youngstown, 4.

Track bolts: Fairfield, Ala., 11; Lebanon, Pa., 3; Minnequa, Colo., 14; Pittsburgh, 7, 78.

Axles: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 7, 9; Johnstown, Pa., 3; McKees Rocks, Pa., 1.

Tie plates: Fairfield, Ala., 11; Gary, 1; Indiana Harbor, Ind., 8; Lackawanna, N. Y., 3; Pittsburgh, Calif., 24; Pittsburgh, 4; Seattle, 62; Steelton, Pa., 3; Torrance, Calif., 24; Minnequa, Colo., 14.

TOOL STEEL

F.o.b. mill

	W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	—	\$1.00
18	4	1	—	—	5	\$1.66
18	4	2	—	—	—	\$1.13
1.5	4	1.5	8	—	—	71.5¢
6	4	2	6	—	—	76.5¢

High-carbon-chromium 57.5¢

Oil hardened manganese 32¢

Special carbon 39.5¢

Extra carbon 24.5¢

Regular carbon 21¢

Warehouse prices on and east of Mississippi are 2 1/2¢ per lb higher. West of Mississippi, 4 1/2¢ higher.

COKE

Furnace, beehive (f.o.b. oven) Net Ton Connellsville, Pa. \$13.50 to \$14.50

Foundry, beehive (f.o.b. oven) Connellsville, Pa. \$15.50 to \$16.00

Foundry, oven coke Buffalo, del'd \$20.90

Chicago, f.o.b. 21.00

Detroit, f.o.b. 20.40

New England, del'd 22.70

Seaboard, N. J., f.o.b. 23.00

Philadelphia, f.o.b. 20.45

Swedeland, Pa., f.o.b. 20.40

Painesville, Ohio, f.o.b. 21.90

Erie, del'd 21.25 to 21.50

Cleveland, del'd 22.63

Cincinnati, del'd 22.71

St. Paul, f.o.b. 23.50

St. Louis, del'd 21.60

Birmingham, del'd 19.75

F.L.D.

F.

STAINLESS STEELS

Product	Base prices, in cents per pound, f.o.b. producing point									
	301	302	303	304	316	321	347	410	418	430
Ingots, rerolling	12.75	13.50	15.00	14.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, rerolling	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.60	18.50	15.25
Forg. discs, die blocks, rings	30.50	30.50	33.00	32.00	49.00	36.50	41.00	24.50	25.00	25.00
Billets, forging	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structural	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50	26.50
								27.00		
Sheets	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

Numbers correspond to producers. See Key on Steel Price Page.

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 27; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Lockport, N. Y., 46. Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 49; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7; Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1, 67; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42. Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Chicago, 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28. Structural: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44.

Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28. Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

REFRACTORIES (F.o.b. works)

Fire Clay Brick Carloads, Per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5)	\$86.00
No. 1 Ohio	80.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	80.00
No. 2 Ohio	72.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	14.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$86.00
Childs, Pa.	90.00
Hays, Pa.	91.00
Chicago District	95.00
Western, Utah and Calif.	101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago	106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	15.00
Silica cement, net ton, bulk, Hays, Pa.	17.00
Silica cement, net ton, bulk, Ensley, Ala.	16.00
Silica cement, net ton, bulk, Chicago District	16.00
Silica cement, net ton, bulk, Utah and Calif.	22.50

Chrome Brick Per Net Ton

Standard chemically bonded, balt., Chester	\$69.00
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Magnesite Brick

Standard, Baltimore	\$91.00
Chemically bonded, Baltimore	80.00

Grain Magnesite St. % -in. grains

Domestic, f.o.b. Baltimore, in bulk, fines removed	\$56.00 to \$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	30.50 to 31.00
in sacks with fines	35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	\$12.25
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METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh. Swedish sponge iron c.i.f. New York, ocean bags... 7.4¢ to 9.0¢

Domestic sponge iron, 98+%

Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+%	31.5¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+%	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+%	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 98.5+%	Fe 90.0¢ to \$1.75
Aluminum	29.00¢
Antimony	42.53¢
Brass, 10 ton lots	23.25¢ to 26.75¢
Copper, electrolytic	28.625¢
Copper, reduced	28.50¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	33.50
Lead	18.50¢
Manganese	55.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	61.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00
Tin	86.50¢
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	15.50¢ to 18.25¢

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb
GRAPHITE		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2 1/2	24, 30	21.00¢
2	24, 30	23.00¢
CARBON		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

PIPE AND TUBING

Base discounts, f.o.b. mills

Base price, about \$200.00 per net ton

Standard, T & C

Steel, Butt-weld	Black	Galv
1/2-in.	40 1/2 to 38 1/2	24 to 22
5/8-in.	43 1/2 to 41 1/2	28 to 26
1-in.	46 to 44	31 to 29
1 1/8-in.	46 1/2 to 44 1/2	31 1/2 to 29 1/2
1 1/2-in.	47 to 45	32 to 30
2-in.	47 1/2 to 45 1/2	32 1/2 to 30 1/2
2 1/2 to 3-in.	48 to 46	33 to 31

Steel, lapweld

2-in.	37	23 1/2 to 22 1/2
2 1/2 to 3-in.	41	25 1/2 to 24 1/2
3 1/2 to 6-in.	44	28 1/2 to 24 1/2

Steel, seamless

2-in.	36	20 1/2
2 1/2 to 3-in.	39	23 1/2
3 1/2 to 6-in.	41	25 1/2

Wrought Iron, buttweld

1/2-in.	+26 1/2	+53
3/4-in.	+16 1/2	+42
1 & 1 1/4-in.	+10 1/2	+33
1 1/2-in.	+4 1/2	+29 1/2
2-in.	+4	+29

Wrought Iron, lapweld

2-in.	+13 1/2	+37
2 1/2 to 3-in.	+11	+32 1/2
4-in.	+6	+26 1/2
4 1/2 to 8-in.	+8	+28
9 to 12-in.	+18	+37 1/2

Extra Strong, Plain Ends

Steel, buttweld	39 1/2 to 37 1/2	24 1/2 to 22 1/2
3/4-in.	43 1/2 to 41 1/2	28 1/2 to 26 1/2
1-in.	45 1/2 to 43 1/2	31 1/2 to 29 1/2
1 1/4-in.	46 to 44	32 to 30
1 1/2-in.	46 1/2 to 44 1/2	32 1/2 to 30 1/2
2-in.	47 to 45	33 to 32
2 1/2 to 3-in.	47 1/2 to 45 1/2	33 1/2 to 31 1/2

Steel, lapweld

2-in.	37	22 1/2 to 21 1/2
3/4 to 3-in.	42	27 1/2 to 25 1/2
3 1/2 to 6-in.	45 1/2 to 41 1/2	41 to 29

Steel, seamless

2-in.	35	20 1/2
2 1/2 to 3-in.	39	24 1/2
3 1/2 to 6-in.	42 1/2	28

Wrought Iron, buttweld

2-in.	+22	+47
3/4-in.	+15 1/2	+40
1 to 2-in.	+5 1/2	+29
2 1/2 to 4-in.	+1	+22
4 1/2 to 6-in.	+5	+26 1/2
7 & 8-in.	list	+21 1/2
9 to 12-in.	+1 1/2	+29 1/2

For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. *Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD gage	Seamless	Electric	Weld
in. in.	BWG	H.R.	C.R.
2	13	\$20.61	\$24.24
2 1/2	12	27.71	32.58
3	12	30.82	36.27
3 1/2	11	38.52	45.38
4	10	47.82	56.25

CAST IRON WATER PIPE

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 20c to base price except Birmingham, Cincinnati, Los Angeles, New Orleans and Philadelphia (*), add 15c).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS				
	Hot-Rolled	Cold-Rolled (16 gauge)	Galvanized (10 gauge)	Hot-Rolled	Cold-Rolled			Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4815 As-rolled	Gold-Drawn, A 4140-50 Ann.
Baltimore.....	5.05	6.24-	6.48-	5.59-	.....	5.20-	5.49	5.49-	6.19	.....	10.05	.....	.....	.....
Birmingham*	5.05 ¹⁰	5.90	6.44 ¹	6.46 ²	5.59 ¹	5.10 ¹⁰	.....	5.20	5.05	5.00 ¹⁰	6.73	.....	.....	.....
Boston.....	5.73	6.48 ²⁰	6.79-	5.78	6.90-	6.95	5.88	5.55	5.80	6.02-	9.70-	8.50-	11.15	11.45
Buffalo.....	5.05	5.80	6.88	6.80	6.41	7.27	5.45	5.15	5.05	5.65	9.60	9.90	11.05	11.35
Chicago.....	5.05	5.80	6.70	5.10	5.45-	6.16	5.20	5.05	5.00	5.65	9.25	9.55	10.70	11.00
Cincinnati*	5.32-	5.80-	6.29-	5.49	.....	5.59-	5.44-	5.39-	6.10-	6.80-	9.80-	9.90-	11.05-	11.35-
Cleveland.....	5.07	6.24	6.39	5.74	.....	5.74	5.59	5.54	6.25	9.81	10.11	11.26	11.56	.....
Detroit.....	5.33	6.08	7.09	5.49	6.27-	6.58	5.89	5.44	5.39	6.03	9.56	9.86	11.01	11.31
Houston.....	5.75	.....	.....	6.10	.....	6.00	5.95	6.10	7.80	10.35-	10.80-	11.50	11.95	12.10
Indianapolis.....	.....	.....	.....	7.36	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kansas City.....	5.85	6.40	7.30	5.70	6.85	5.80	5.65	5.60	6.35	9.85	10.15	11.30	11.80	.....
Los Angeles*	5.80	7.00	7.45 ²	5.85	7.35-	7.85 ¹⁶	5.80	5.70	5.80	7.55	10.05	10.20	11.70	12.10
Memphis.....	5.83	6.68	.....	5.98	6.80	6.08	5.93	6.68	.....	.....	.....	.....	.....	.....
Milwaukee.....	5.19	5.94	6.84	5.24	6.32	6.34	5.34	.....	5.14	5.89	9.39	9.69	10.84	11.14
New Orleans*	5.50 ¹	6.85 ¹	.....	5.55 ¹	6.90 ¹	5.65	5.55 ¹	5.55 ¹	6.75	.....	.....	.....	.....	.....
New York.....	5.55-	6.54-	6.90-	5.84	6.76 ⁵	5.70	5.45	5.65	6.44	9.60	9.90	11.05	11.35	.....
Norfolk.....	5.65	6.64	7.00	.....	6.30	.....	6.15	6.20	6.15	7.20	.....	.....	.....	.....
Omaha.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Philadelphia*	5.30	6.20	6.70	5.65	6.29	5.45	5.25	5.50	6.31	9.35	9.65	10.80	11.10	.....
Pittsburgh.....	5.05	5.80	6.70	5.20	6.00	5.20	5.05	5.00	5.75	9.25	9.55	10.70	11.00	.....
Portland.....	6.60-	8.40 ²	8.20 ²	6.85 ²	.....	.....	6.50	6.45-	8.80 ¹⁴	12.00 ¹⁸	11.60 ¹⁸	.....	.....	0.0
Salt Lake City.....	5.85	6.70	8.75	7.45	8.75	6.10 ²	5.90	7.35 ⁸	8.75	.....	.....	.....	.....	.....
San Francisco.....	6.25 ¹¹	7.80 ²	7.50 ²	6.75 ¹¹	8.25	6.15 ¹¹	6.00	6.15 ¹¹	7.80	.....	.....	.....	.....	.....
Seattle.....	6.70 ¹	8.15 ²	8.20 ²	7.35 ⁴	.....	6.35 ⁴	6.20 ¹⁴	6.35 ⁴	8.50 ¹⁴	.....	10.60 ¹⁸-	.....	13.00 ¹⁸ -	0.1
St. Louis.....	5.38	6.13	7.03	5.43	6.68-	5.53	5.38	5.33-	6.08	9.58	9.88	11.03	11.33	0.5
St. Paul.....	5.76	6.51	7.41	5.81	6.18-	5.91	5.76	5.71	6.42	8.86	10.28	11.41	11.71	0.7

BASE QUANTITIES: (Standard unless otherwise keyed on prices).

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 9999 lb. Cold-finished bars: 1000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES						DELIVERED PRICES (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	48.00	48.50	48.00	48.50	.....	Boston.....	Everett.....	\$0.50 Arb.	.....	50.50	51.00	.....	.....
Birmingham.....	41.88	42.38	.....	.....	.....	Boston.....	Steelton.....	6.90	.....	52.79	53.29	53.79	60.90
Buffalo.....	46.00	46.50	47.00	.....	.....	Brooklyn.....	Bethlehem.....	4.29	.....	51.13	51.63	52.13	.....
Chicago.....	46.00	46.50	46.50	47.00	.....	Cincinnati.....	Bethlehem.....	2.63	.....	51.70	52.20	52.70	54.33
Cleveland.....	46.00	46.50	46.50	47.00	51.00	Jersey City.....	Geneva-Ironton.....	7.70	53.70	54.20	54.70	55.20	56.70
Duluth.....	46.00	46.50	46.50	47.00	.....	Los Angeles.....	Mansfield.....	3.33	49.33	49.83	49.83	50.33	51.89
Erie.....	46.00	46.50	46.50	47.00	.....	Philadelphia.....	Philadelphia.....	2.39	50.39	50.89	51.39	51.89	53.33
Everett.....	.....	50.50	51.00	47.00	.....	Philadelphia.....	Sweden.....	1.44	49.44	49.94	50.44	50.94	52.44
Granite City.....	47.90	48.40	48.90	.....	.....	Philadelphia.....	Steelton.....	3.09	.....	51.13	51.63	52.13	53.63
Ironton, Utah.....	46.00	46.50	46.50	47.00	.....	Philadelphia.....	Philadelphia.....	2.63	48.63	49.13	49.63	50.13	51.63
Pittsburgh.....	46.00	46.50	46.50	47.00	.....	Philadelphia.....	Philadelphia.....	2.39	50.39	50.89	51.39	51.89	53.33
Geneva, Utah.....	46.00	46.50	46.50	47.00	.....	Philadelphia.....	Philadelphia.....	1.44	49.44	49.94	50.44	50.94	52.44
Sharpenville.....	46.00	46.50	46.50	47.00	.....	Philadelphia.....	Philadelphia.....	3.09	.....	51.13	51.63	52.13	53.63
Steelton.....	46.00	46.50	49.00	49.50	54.00	Philadelphia.....	Philadelphia.....	2.63	48.63	49.13	49.63	50.13	51.63
Struthers, Ohio.....	46.00	.....	.....	.....	.....	Philadelphia.....	Philadelphia.....	2.39	50.39	50.89	51.39	51.89	53.33
Sweden.....	46.00	46.50	49.00	49.50	54.00	Philadelphia.....	Philadelphia.....	1.44	49.44	49.94	50.44	50.94	52.44
Toledo.....	46.00	46.50	46.50	47.00	.....	Philadelphia.....	Philadelphia.....	3.09	.....	51.13	51.63	52.13	53.63
Troy, N. Y.....	46.00	46.50	46.00	46.50	54.00	Philadelphia.....	Philadelphia.....	2.63	48.63	49.13	49.63	50.13	51.63
Youngstown.....	46.00	46.50	46.50	47.00	.....	Philadelphia.....	Philadelphia.....	2.39	50.39	50.89	51.39	51.89	53.33

Producing point prices are subject to switching charges; silicon differential (not to exceed 50c per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differentials, a reduction of 38c per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50c per ton for each 0.50 pct manganese

content in excess of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—\$57.00; f.o.b. Buffalo, \$58.25. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct.

Add 50c per ton for each 0.50 pct Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferr-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$68.56. High phosphorus charcoal pig iron is not being produced.

FERROALLOYS

Ferromanganese

75-82% Mn. maximum contact base price, gross ton, lump size.	base
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Clairton, Pa.	\$175
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn	19-21% Mn
3% max. Si	3% max. Si
Palmerton, Pa.	\$64.00
Pgh. or Chicago	65.00
	66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Manganese

Contract price, cents per pound Mn contained, lump size, delivered.			
Carloads	Ton	Less	
0.07% max. C, 0.06%			
P, 90% Mn	25.25	27.10	28.30
0.10% max. C	24.75	26.60	27.80
0.15% max. C	24.25	26.10	27.30
0.30% max. C	23.75	25.60	26.80
0.50% max. C	23.25	25.10	26.30
0.75% max. C			
7.00% max. Si	20.25	22.10	23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload, bulk	8.95
Ton lots	10.60
Briquet, contract basis carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.30
Less ton lots	12.80

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area; Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe

97% Si, 1% Fe

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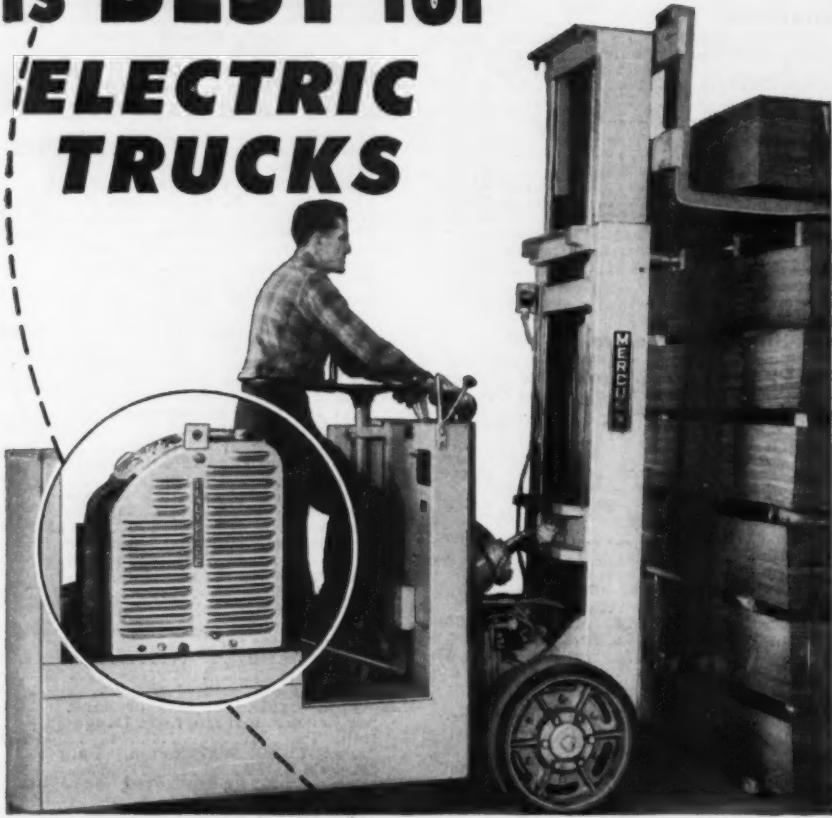
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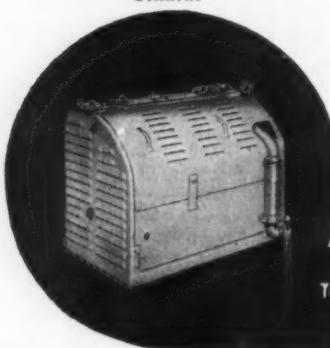
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Ready-Power-Equipped Mercury Fork Truck



Ready-Power-Equipped Clark "Utilitrac"



THE **READY-POWER** CO.

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• News of Industry •

Navy Cuts Manhours With Mechanized Handling System

Chicago—Manhours required to move 100 tons of supplies from producers to overseas consumers were reduced from 682 to 203 during World War II by use of the palletized unit load and the fork truck. This was disclosed by Lt. Com. M. A. Borst, head of the Navy's research and development program in materials handling and packaging, at the Midwest Materials Handling Conference held at the Illinois Institute of Technology on Feb. 1.

Industry Reports Savings

More than 1 million sq ft of warehouse space has been recovered by the Navy since the war by maximum palletizing in its warehouses. The Navy recovered one third of available space by employing modern methods in another materials handling activity, he said.

Palletizing has effected savings by reducing handling breakage, pilfering, needed space, packaging and paper work according to C. H. Barker, Jr., of the Lamson Corp. in an address delivered at the conference. Mr. Barker added that within 5 years most straight carloads and truck loads would be moving as unit loads.

Increasing acceptance of unit packaging and palletized loads by shippers and consumers was described by Leo H. Ballarby of Nash Motors. More suppliers are delivering material in unit packages, and the use of expendable skids and packages is included in most contracts for new material, he said.

Carnegie Tech Receives Grant

Pittsburgh—Carnegie Institute of Technology has received a \$100,000 grant, according to Robert E. Doherty, president.

The grant, made by the Carnegie Corp. of New York, will be given to the school in three annual installments to help develop its Carnegie plan of professional education in the College of Engineering and Science.

THE IRON AGE

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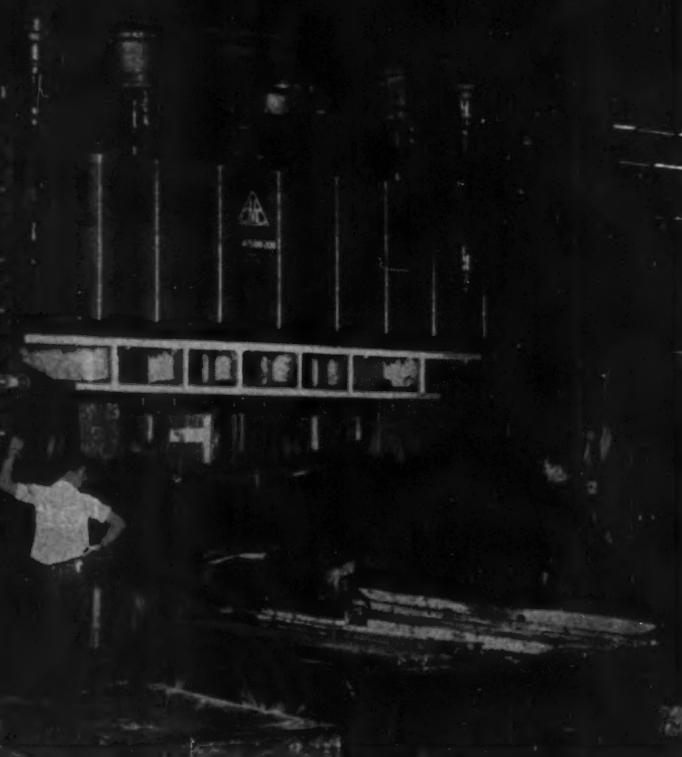
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19



UNIVERSITY OF MICHIGAN LIBRARIES

SUNVIS GOING STRONG AFTER 3,500 HOURS

Body-Stamping Presses Still in A-1 Condition; Make-Up Oil Amounts to Only 1% per Month

One of the best-known automobile manufacturers selected Sunvis to lubricate three brand-new body-stamping presses. This equipment involved a big investment, and the company wanted the finest protection available.

After 15 months' use, the oil was tested and found to be in virtually

the same condition as at the start. The machines were carefully examined and proved to be as good as new. The original charge of Sunvis is still in service and make-up oil has amounted to only one percent per month.

Because of performance like this, "Job Proved" Sunvis Oils are in

wide demand wherever the finest lubrication is needed. They have high stability over a wide range of speeds, loads, and temperatures. You can count on Sunvis Oils for top performance and the surest protection of your machines. For full information call your nearest Sun Office.

SUN OIL COMPANY • Philadelphia 3, Pa.
In Canada: Sun Oil Company, Ltd.
Toronto and Montreal

SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY



Continued from Page 25

strip for action . . .

FOLLANSBEE POLISHED BLUE STRIP will give you real action in the production-line because it's furnished in coils for feeding right into your automatic machines. For the utmost efficiency and economy in continuous operations try this superior Follansbee Polished Blue in coils—the distinctive color is a real asset in any product.

making figurines for faddists

FOLLANSBEE POLISHED BLUE STRIP fits into many types of products, figurines or furnishings or fryers. The uniform-blue, high-gloss finish of Follansbee Polished Blue attracts discriminating buyers. In coils for automatic production, and with mechanical and physical specifications to fit your needs, you'll find it worth while to tool for Follansbee Polished Blue and the other Follansbee Specialty Steels.



WILLIAM J. POWERS, manager, clad and conversion sales department, Lukens Steel Co.

William J. Powers, who has been acting manager of the clad and conversion sales department, LUKENS STEEL CO., Coatesville, Pa., since 1949, has been appointed manager of that department.

L. W. Alberts has been appointed manager of the recently organized synthetic fuels and chemicals department of the chemical plants division of BLAW-KNOX CO., Pittsburgh. This department will provide technical and construction services for the building of facilities for the manufacture of synthetic chemicals and fuels from natural sources.

Fred W. Sexauer was appointed to the position of manager of tube sales of the BRAINARD STEEL CO., Warren, Ohio. Mr. Sexauer comes to Brainard after many years' experience in the electric-welded steel tubing field with the Michigan Steel Tube Products Co., Detroit.

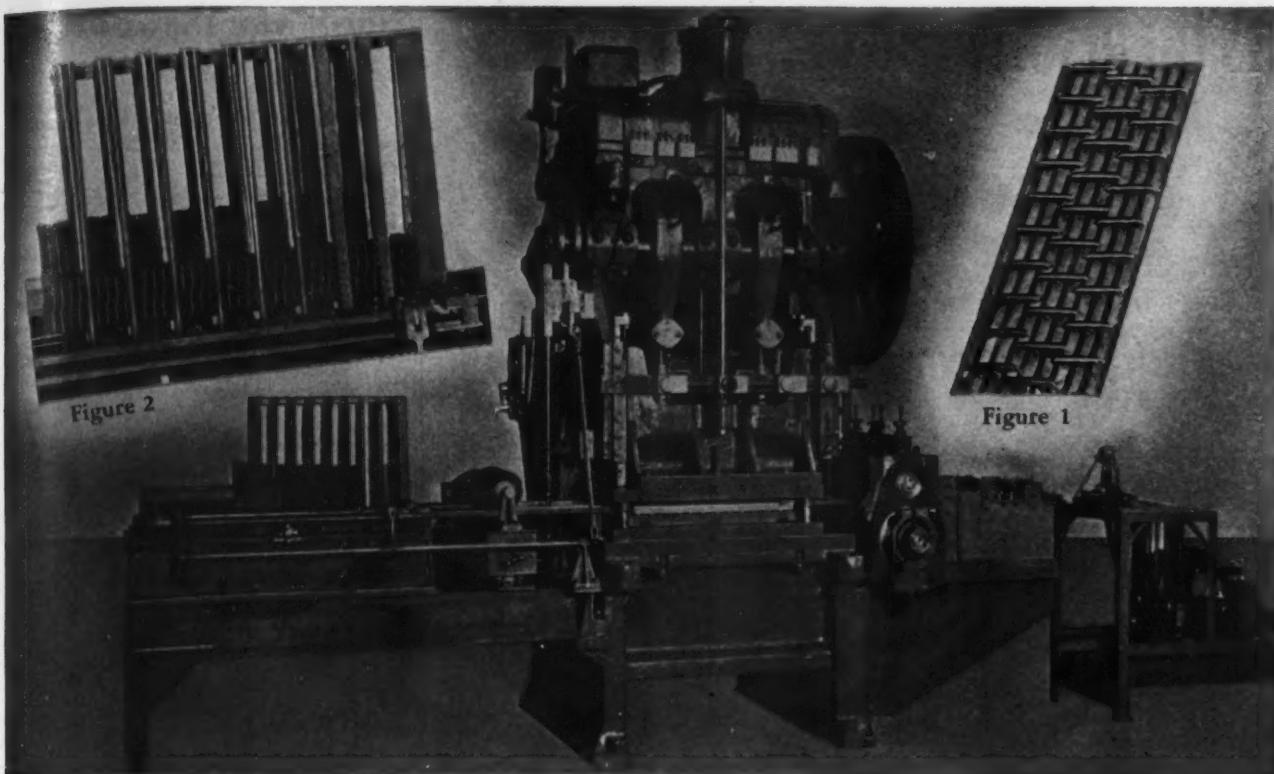


Figure 2

Figure 1

CLEVELAND press stacks up 120 fins a minute

120 automobile radiator fins are stacked up per minute as raw metal is uncoiled, corrugated, punched and sheared *automatically* by a leading automotive parts manufacturer using this new Cleveland Press fabricating unit.

Two strips of metal are pulled through the beading and corrugating coils by automatic coil feed. Then they are fed into the Press, which is single geared and equipped with a single station electrically controlled Cleveland Drum Type Friction Clutch. Here they are punched and sheared to length as in Figure 1. Rotating brushes pass the completed fins to the stacker where they are collected in two piles (see Figure 2).

Selecting the right press from Clevelands' wide variety of sizes and types was easy. The tough problem was how to stack the rough surfaced fins. Cleveland engineering ingenuity solved this by stacking *from the bottom* while the load is held in a raised position by a set of elevator fingers. Finished stacks can be readily removed without disturbing press operation.

If you have a production problem demanding greater press efficiency, be sure to investigate the Cleveland line. One of the many sizes and types available will undoubtedly meet your requirements. Cleveland engineers will gladly work with you on special problems.

A-2716

LAWRENCE F. DODD, CLEVELAND PRESS CO.

PUNCHING TOOLS & DIES

OFFICES AT:
NEW YORK...CHICAGO
DETROIT...PHILADELPHIA
PITTSBURGH

THE
CLEVELAND
PUNCH & SHEAR WORKS CO.
U. S. A.

Established 1880

POWER PRESSES

FABRICATING TOOLS

CLEVELAND 14, OHIO

IT'S THE RESULTS YOU GET, THAT COUNTS!



• NEWEST DEVELOPMENT FOR
BETTER AND MORE ECONOMICAL
PEENING AND BLAST CLEANING

BETTER because the pellet size and mass remain uniform many times longer than with other types of shot. And it is extremely durable, outlasting conventional hard iron shot 8 to 1 and cast steel shot at least 2 to 1.

MORE ECONOMICAL. Abrasive purchases are greatly reduced, there is less freight and freight handling cost, and less equipment wear and maintenance.

YOUR FIRST ORDER
IS CONVINCING.
Mail it Now.

IMMEDIATE SHIPMENT
of a size to best meet your
individual needs.

After 98 Hours' Use

THE CLEVELAND METAL ABRASIVE CO.

Main Office and Plant: 880 East 67th Street, Cleveland 8, Ohio
Howell Works—Howell, Michigan

IRON AGE INTRODUCES

Continued

Ernest S. Thompson was made sales representative in the New Haven, Conn., area for the SOLAR STEEL CORP., Hanover division, Union, N. J. Linton S. Steepe will serve the same company as representative in the Webster, N. Y., area. Mr. Thompson's offices will be at 367 Alden Ave., New Haven, and Mr. Steepe's headquarters at 153 W. Main St., Webster, N. Y.



GABRIEL V. BUREAU, field engineer, equipment sales department, radio tube division, Sylvania Electric Products Inc.

Gabriel V. Bureau was appointed field engineer of equipment, sales department of the radio tube division, SYLVANIA ELECTRIC PRODUCTS INC., New York. He was formerly technical commercial manager for the North American Philips Co. and assistant sales manager for the Amperex Electronics Corp.

Charles F. DeBardeleben and Alfred M. Shook, III, were elected to fill two of the vacancies on the board of directors of the WOODWARD IRON CO., Birmingham. The vacancies were caused by the resignations of Directors Frederick Ayer, H. A. Berg and Oscar Wells. Mr. Ayer had served on the board since 1916, Mr. Berg served as president and director from 1933 to 1948 and as a director since 1948 and Mr. Wells had served on the board since 1920.

Paul E. Thomas was made assistant general superintendent in charge of service department of the Gary steel works of CARNEGIE - ILLINOIS STEEL CORP. Mr. Thomas has been associated with U. S. Steel subsidiaries since 1920. Since July, 1949, he has been assistant to the general superintendent.



DAVID KIRK STUART, manager, Pittsburgh branch, Crucible Steel Co. of America.

David Kirk Stuart has been named manager of the Pittsburgh branch of the CRUCIBLE STEEL CO. OF AMERICA. He will fill the position left open by the promotion of John S. Billingsley to central sales manager last Aug. Richard J. Rand becomes assistant branch manager.

Ray D. Michaels was promoted to assistant comptroller of the DEARBORN MOTORS CORP., Detroit. Mr. Michaels has been with the company for three years as chief accountant. Prior to that, he was with the Detroit Diesel division of General Motors. H. F. Froehlich moves up to assistant purchasing manager. Mr. Froehlich has been active in the purchasing field for 22 years and has been with the firm for two years as a buyer.

R. F. Gomber has been named assistant manager of the industrial products advertising and sales promotion department, WESTINGHOUSE ELECTRIC CORP., Pittsburgh. E. W. Seay was named sales promotion manager of the eastern district to replace Mr. Gomber. Mr. Seay will headquarter in New York.

Erb Gurney was appointed manager of sales, forgings, castings and ordnance, BETHLEHEM STEEL CO. Mr. Gurney, a graduate of Oregon State College, came to Bethlehem in 1927 and has worked in various capacities in the operating and sales departments.

Harry M. Reed was elected a director of VANADIUM-ALLOYS STEEL CO., Latrobe, Pa. Mr. Reed has been associated with the organization since 1925 and was elected secretary of Vanadium-Alloys Steel Co. in 1947. He replaces Alexander Nimick, Sr., deceased.



They're More Economical . . .

That's right, Certified Samson Shot and Angular Grit are more economical because each grain is a solid homogeneous mass that wears away slowly, lasts longer for top-efficiency blast cleaning at lowest cost.

They're Extra Tough . . .

Extra toughness gives you faster, better cleaning besides longer wear. Certified's special automatically controlled hardening process gives them this toughness. We use 'em over and over again!

So take a tip from me, specify Certified Abrasives for faster, better, cheaper, safer blast cleaning.



All sizes graded to
S. A. E. specifications

PITTSBURGH
CRUSHED STEEL CO.
PITTSBURGH, PENNA.

STEEL SHOT
AND GRIT CO.
BOSTON, MASS.

LEBANON ALLOY CASTINGS

Resist Sulphuric Acid Attack



Valve Bodies and Fittings cast at Lebanon in various special sulphuric acid resistant alloys.

FOR CHEMICAL AND PROCESS INDUSTRY APPLICATIONS . . .

LEBANON CIRCLE L 34

NOMINAL ANALYSIS

Carbon Max.	0.07 Max.
Silicon	1.25
Manganese	0.75
Chromium	20.50
Nickel	28.50
Molybdenum	2.50
Copper	4.25

NOMINAL PHYSICAL PROPERTIES

Tensile Strength . . .	72,000
Yield Point	35,000
Elongation in 2"-%	45
Brinell Hardness . . .	150

Heat treatment: Water quenched.

*Circle L 34 (FA 20)
DuPont Specification 1364

LEBANON
ALLOY AND STEEL

Castings
CIRCLE
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IRON AGE INTRODUCES

Continued



EINO HILL, representative in the Chicago area for the New Britain-Gridley division, New Britain Machine Co.

Eino Hill was appointed an additional representative in the Chicago territory for the New Britain-Gridley division of the NEW BRITAIN MACHINE CO. He will serve with Jack Berry, who has been the Chicago representative of the company for many years.

F. Carlin Gray joined the Washington office of PHELPS DODGE COPPER PRODUCTS CORP. Mr. Gray was previously associated with the Copper Wire Engineering Association as an engineer.

Erik Anker was made manager director of TITAN CO. A/S of Fredrickstad, Norway. Mr. Anker succeeds Dr. Gustav Jebsen, who retired Feb. 1. Dr. Jebsen had been managing director of the company since 1922.

Donald L. Clark, Lockport, N. Y., has been appointed to fill the unfinished term of vice-president of the ELECTRIC METAL MAKERS GUILD, INC., made vacant by the resignation of E. J. Chelius.

W. C. Connelly was re-elected president of the OHIO SEAMLESS TUBE CO., Cleveland, at a recent annual meeting of the company. All other officers and directors were renamed.

John Menz has been named products manager for KAISER ALUMINUM & CHEMICAL SALES INC., with headquarters at the company plant, Newark, Ohio, where he will supervise the sale of non-electrical products.

O. O. Rae succeeds Thomas Fuller as manager of WESTINGHOUSE ELECTRIC'S southeastern district. Mr. Fuller is retiring after 44 years with the company. Formerly central station manager of the southeastern district, Mr. Rae has served as assistant district manager for the past two months.

George L. Alston has resigned as vice president, secretary and treasurer of the GENERAL STEEL CASTINGS CORP., Granite City, Ill., and James Macdonald was elected to treasurer with Thomas J. Christian named to fill the secretary post.



RICHARD W. CLAYPOOLE, assistant manager of sales, railroad materials and commercial forgings division, Carnegie-Illinois Steel Corp.

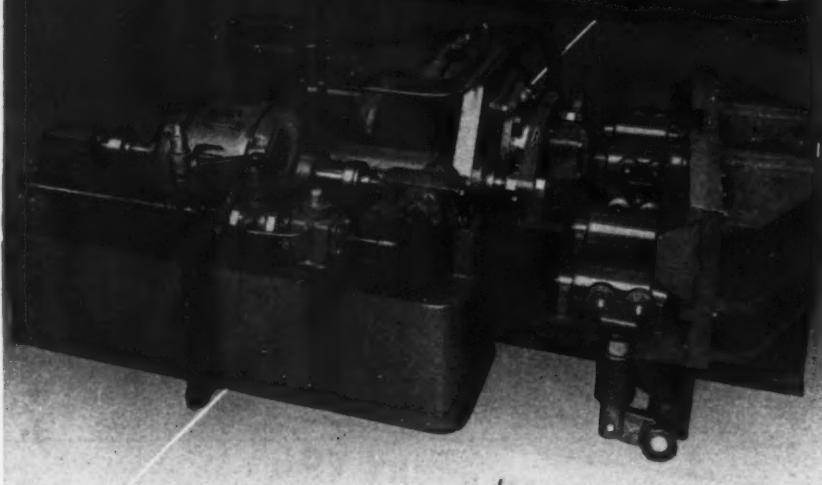
Richard W. Claypoole was named assistant manager of sales, railroad materials and commercial forgings division, CARNEGIE - ILLINOIS STEEL CORP. He joined the railroad sales division of the company in Pittsburgh in 1946 as a product representative and was made assistant to the manager in 1947, the position he held at the time of his present appointment.

F. H. Clark becomes sales manager of the Standard Control division, WESTINGHOUSE ELECTRIC CORP., Pittsburgh. Mr. Clark joined the company in 1942 in the industrial division of the Boston sales office. He was transferred to the Standard Control division in 1948 as manager of the small AC control sales section, and comes to his new duties from that position.

Paul Stone becomes assistant Los Angeles zone manager for the Pontiac Motor div. of GENERAL MOTORS CORP. to succeed Howard L. Robinson who has been advanced to zone manager at Houston, Tex.

Smooth...Fast...Accurate

THE R. D. WOOD STRAIGHTENING PRESS



For STRAIGHTENING

**SHAFTING
AXLES
ROUND BARS
RODS**

The modern design and quality construction of this 200-ton R. D. Wood Shaft Straightening Press are your guarantee of smooth, fast, accurate handling of work . . . plus increased production.

The press frame is constructed of heavy welded steel and carries individual cast steel main and pull-back cylinders. Press table is 73" long with a gap of 13" between dies. Resistance blocks are movable on the vertical frame face. The table is provided with four heavy stationary rollers for shifting shafts lengthwise, as well as four sets of lifting and turning rollers operated by an air cylinder. An adjustable stop, which will take full press load, is located in the center of the press frame to prevent over-bending. High and low pressure pumps, operated by a 20-hp motor, provide a ram speed of 72" per minute for low pressure closing. High pressure ram speed is 8.5" per minute. Send today for descriptive literature. R. D. Wood Company, Ledger Building, Independence Square, Philadelphia 5, Pa.

When faced with problems involving hydraulic presses and equipment, it will pay you to consult with R. D. Wood engineers.

HYDRAULIC PRESSES AND VALVES FOR ENGINEERS • INVESTIGATORS • INTENSIFIERS



Here's How To:

- Cut Your Floor Maintenance Costs
- Reduce Slipping Accidents
- Improve Your Products

FOOT SAFETY IN EVERY FOOT

Install A.W. Super-Diamond Rolled Steel Floor Plate in your plant and you eliminate floor maintenance bills and costly slipping accidents. It requires no maintenance, and the exclusive engineered Super-Diamond Pattern "grips without a slip" keeping men's feet safe and secure. A.W. Super-Diamond improves products too. On machine tool bases, saddle tanks, lift trucks, and on heavy construction equipment, both stationary and mobile, it guards against slipping accidents. Architects, product engineers, safety engineers and purchasing agents, everywhere specify Super-Diamond for safety.

Write or use the coupon for Free information-packed 16-page catalog L-27.

A.W. SUPER-DIAMOND
FLOOR PLATES THAT GRIP

A Product of ALAN WOOD STEEL COMPANY
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Gentlemen:
Please send me a Free copy of your 16-page Super-Diamond Catalog L-27.

Name _____ Title _____
Company _____
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Other Products: PERMACLAD, Stainless Clad Steel • A.W. ALGRIP ABRASIVE Floor Plate
Billets • Plates • Sheets • Strip • (Alloy and Special Grades).

IRON AGE INTRODUCES

Continued

John G. Beadle has been appointed vice president to head the sales division of the A. B. DICK CO., Chicago. Mr. Beadle brings to his new position years of varied sales management experience. Mr. Beadle replaces Harry C. Anderson, formerly vice president of the company. Mr. Anderson resigned to become president of the H. C. ANDERSON MIMEOGRAPH CORP., New York, the new authorized distributor for A. B. Dick Co. in the New York area.



GUS GRAN, Detroit staff, New Britain-Gridley division, New Britain Machine Co.

Gus Gran was added to the Detroit office of the New Britain-Gridley division of the NEW BRITAIN MACHINE CO. Mr. Gran had been with Colonial Broach for the past 16 years.

Max I. Alimansky, until recently engineer of the capacitor divisions for the GENERAL ELECTRIC TRANSFORMER & ALLIED PRODUCT divisions at Pittsfield, Mass., has been appointed assistant to the manager of engineering. Succeeding Mr. Alimansky will be Merritt E. Scoville. Clement E. Sutton, Jr., was made manager of the distribution transformer sales division. Mr. Sutton's former position as manager of the power transformer sales division is now held by John W. Butler, heretofore manager of the commercial engineering division. Howard R. Humphrey was appointed manager of the new general service division. He was formerly administrative assistant to the manager of sales. Harold M. Jalonack, formerly manager of sales planning, becomes manager of the marketing and promotional service division.

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THE IRON AGE

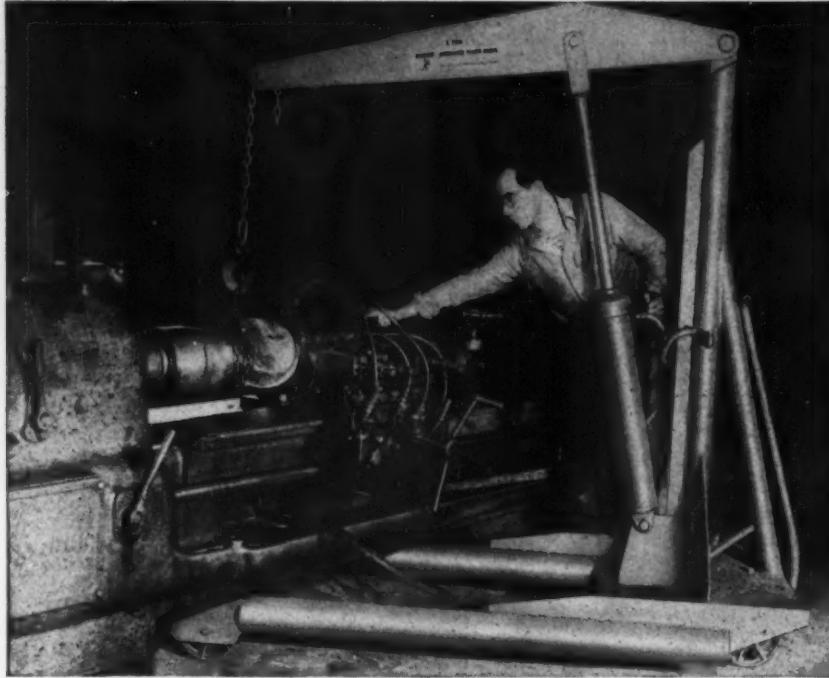
Quantity
PRODUCTION
of
GREY IRON CASTINGS

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY
FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE



For handling forgings, castings, dies, general plant maintenance and millwright work. Lift to 13 ft.; capacities to 6000 lbs.

Try this **RUGER** for *Ten Days Free*
Hydraulic Floor Crane

Fill out the coupon below. Mail it to us attached to your letterhead. We'll contact our distributor in your territory and arrange with him to furnish you a genuine Ruger Hydraulic Floor Crane for a *ten day free trial* in your own plant.

There are no strings attached . . . no obligation to buy. If, at the end of the ten-day free trial, you believe that you can get along without the Ruger, it will be removed at no cost to you.

Remember, this is the genuine Ruger, the original Hydraulic Floor Crane that eliminates back-breaking heavy lifting and saves time and money in thousands of plants from coast to coast. Perhaps you may have wondered whether the Ruger could do

as much for you. Here is your chance to find out without spending any money or obligating yourself in any way.

Mail coupon today as we must reserve the right to withdraw this free trial offer at any time and without prior notice.

Attach this coupon to your letterhead

Please arrange for us a ten-day free trial of a Ruger Hydraulic Floor Crane. We understand that this request does not obligate us in any way.

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Company _____

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RUGER *Equipment Co. Inc.*



Load Lifting and Handling Devices
605 West Fourth Street • Uhrichsville, Ohio

Dear Editor

SCOVILL'S CONTINUOUS BRASS MILL

The special article appearing in the December 22, 1949, issue about "Scovill's New Continuous Brass Mill" is most interesting. Since we intend to modernize our own rolling mill, we would find it very useful if you could furnish us with a reprint or tear sheets of this article.

P. A. GOREIL
Metallurgist

Dominion Foils (Canada) Ltd.
Cap de la Madeleine, P.Q.

We would like to have 3 reprints of the write-up about the new equipment at Scovill Mfg. Co.

K. ORBAN
President

Kurt Orban Co., Inc.
New York

Would it be possible for us to obtain six reprints, including the colored chart, of the article describing Scovill's continuous brass mill. We have been a subscriber to THE IRON AGE since 1907.

E. M. MADDEN
Librarian

American Brass Co.
Waterbury, Conn.

The article, "Scovill's New Continuous Brass Mill," is most interesting, and I would like to have a reprint if copies are still available.

JOHN M. SHERMAN
Research and Statistics Dept.
Federal Reserve Bank of Boston

We would like to obtain reprints of the article "Scovill's New Continuous Brass Mill," published in the December 22, 1949 issue.

W. KAUDERS
Hydropress, Inc.
New York

A few copies of this popular reprint are still available at 15¢ each, and may be obtained by writing to Readers Service, THE IRON AGE, 100 E. 42d St., New York.

STEEL EXPORT

The Dept. of Commerce has recommended that I write to you to obtain the following information for several European correspondents: (1) Availability of concrete reinforcing bars for export from the United States to Europe during 1947; (2) whether or not the quality of this merchandise was as represented when handled through export channels other than reputable steel mills; (3) length of time for delivery after establishment

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Separate sections are devoted to stainless steel machine screws, nuts, caps and bolts, wood and sheet metal screws, rivets, set screws, washers, pins and nails. In addition, each page shows list prices for all items and a quantity discount chart which makes cost estimating a simple task!

Supplementary List of Hard-to-Get Items IN STOCK; Special Alloy Section

Thousands of odd sizes and varieties in stock are found in the supplementary stock list. In addition, special sections are devoted to type 316 and other special alloys. Other items can be obtained rapidly through our special order service.

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Castleton-on-Hudson, New York

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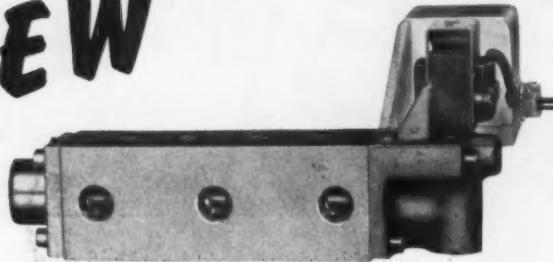
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Metal Products Co., Inc.
Manufacturers of STAINLESS STEEL FASTENINGS
CASTLETON ON HUDSON, NEW YORK

Quick-As-Wink

type "SA" solenoid pilot operated
single plunger control valves

NEW



- smaller, shorter stroke solenoids — lower amperage
- simpler electrical controls — high air economy...

Small solenoids traveling through only a $\frac{1}{8}$ " stroke move a small pilot valve plunger to apply air to the operating piston to move the main valve plunger. All operating parts are rugged, yet weigh only a few ounces. Reduced amperage eliminates intermediate relays, simplifying control circuits. Positive high cycle operation, without destructive impact, reduces maintenance and minimizes trouble due to voltage variations. 2-way, 3-way, 4-way and 5-way designs. $\frac{3}{8}$ " to 1" sizes, with bucking cylinder return. *Send for Data Sheet No. 1611. It gives full details.*

Individual DATA SHEETS for Each Valve
— give complete details. Write today!



Hand Operated Air Valves—
wide variety of uses. 2-way,
3-way, 4-way neutral position
and compound exhaust.



Foot Operated Air Valves—
workman has both hands free,
speeding production. 2-way,
3-way and 4-way actions.



Single Plunger Valves—for
air or low pressure hydraulic
service. Lever, pilot, cam, dia-
phragm or solenoid operated.
2-way, 3-way, 4-way actions.



Series "O" and "OE" Valves
—for air or hydraulic service
up to 125 PSI. Push-pull, cam,
pilot, diaphragm and solenoid
operated. $\frac{1}{8}$ " and $\frac{1}{4}$ " pipe
connections. 2-way, 3-way,
4-way and 5-way actions.



Hydraulic Valves—Up to
5000 PSI. Conservatively rated.
 $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1" and $1\frac{1}{2}$ " sizes.
2-way, 3-way, 4-way actions.



Hydraulic Valves—Up to
5000 PSI. Pilot cylinder oper-
ated. $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1", $1\frac{1}{2}$ ",
 $2\frac{1}{2}$ ", 3" and 4" sizes.
2-way, 3-way, 4-way actions.



Quick-As-Wink Control Valves

Manufactured by C. B. HUNT & SON, Inc.

1911 East Pershing Street, Salem, Ohio

DEAR EDITOR

Continued

of letters of credit in U. S. banks by European buyers; and (4) U. S. Maritime situation—were there any strikes during 1947 which might have affected delivery?

L. W. HANSON
Hartford, Conn.

Records show that the export tonnage of this product during that year was 248,373 tons, the highest of recent times. This compares with 194,652 net tons in 1946, 130,298 net tons in 1948, and approximately 125,000 net tons in 1949. However, steel was extremely difficult to obtain in 1947 and there was widespread selling above listed prices in the so-called gray market. There are a number of different grades of concrete reinforcing bars, both rebar and billet steel, and a wide range of specifications. Whether or not any individual shipment met these specifications and representations made by sellers, depends entirely on what representations were made. Because of the scarcity of steel in 1947, buyers in many cases did not insist upon as strict specifications as in years when there has been a more abundant supply. The scarcity in many cases also lead to longer delivery delays than in other years. Funk and Wagnalls New International Yearbook covering that year does not show any major industry-wide strikes, although it is possible that individual concerns may have had strike difficulties. —Ed.

25-TON ANVIL

In the September 8, 1949, Newsfront, mention is made of an anvil casting weighing 50,000 lb in nodular cast iron. I notice, however, that the article on p. 78 of the same issue entitled "Graphite Nodulizing Alloy" refers to the development work on this cast iron but gives no details of the casting. If any details have been published about this anvil casting we should be very glad to have the information.

R. SEWELL
Information Officer
United Steel Companies, Ltd.
Stocksbridge, England

So far there has been no published information on this particular foundry operation. However, we expect to publish a technical article on the problems involved in casting such a large piece in nodular iron in the near future. The foundry production of these castings has apparently been quite successful and is being pursued on a regular basis.—Ed.

NODULAR IRON

It was with considerable interest that I read the article by C. R. Austin in the December 1, 1949, issue of THE IRON AGE, entitled "Some Engineering Aspects of Nodular Cast Iron." It will be greatly appreciated if you will kindly send me a reprint of this article so that I can make it available to my students in our testing materials laboratory course.

R. B. PALMER
Instructor
Massachusetts Institute of Technology
Cambridge, Mass.

Copy has been sent.—Ed.

THE IRON AGE

2 OPERATIONS ELIMINATED— REJECT PROBLEM SOLVED

when they changed to Carpenter Stainless Tubing



Your unit costs really go down when you
find ways to make savings like these—

Boxes of split rejects piled up on the floor. Each part had to be annealed and pickled between draws. Then the fabricator switched to Carpenter Stainless Tubing.

Now the parts are produced 32-per-minute, there is no reject problem and the annealing-pickling set-up has been eliminated—all because of the quality and uniformity of Type 304 Carpenter Stainless Tubing.

To find ways to reduce your unit production costs, drop us a line or call your Carpenter Stainless Tubing Distributor. Put our experience to work on *your* problems. THE CARPENTER STEEL COMPANY, ALLOY TUBE DIVISION, 114 Springfield Road, Union, N.J.

RUSH SERVICE on your orders is an everyday habit with Carpenter Stainless Tubing Distributors.



Stainless Tubing Data for Quick Reference . . .

A note on your company letterhead will start this handy Carpenter Stainless Tubing File on its way to you. It contains information on physical constants, sizes and shapes, corrosion resistance, etc. Write today for your copy.

Carpenter

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"MORE THAN CORROSION RESISTANCE"





= Low Handling Costs



Majority Stockholder Looks at MONARCH SOLID TIRES

Lower — much lower — handling costs is exactly right. Monarch Solid Tires require no maintenance, have an extra long service life, so they cut tire costs both ways. They're tough, stable, sure-footed, and they can't puncture — Monarch-equipped vehicles go anywhere in the plant.

Monarch specialization pays off for you in better industrial tires, including such special types as Monarch Easy-Roll, Cushion, Static Conductor, and Neoprene Tires.

Write for specific information. THE MONARCH RUBBER CO., 301 Lincoln Park, HARTVILLE, OHIO.

Specify Monarch Solid Tires on your industrial vehicles. Monarch Tires for replacement available from the manufacturer of your equipment.



Specialists in Industrial Solid Tires
and Molded Mechanical Rubber Goods

FREE

PUBLICATIONS

Continued from Page 36

straight line, scattered and staggered hole punching patterns at varying center to center distances, are described in a 16-p. catalog giving details of Wales type CJ hole punching units. *Wales-Strippit Corp.* For more information, check No. 12 on the postcard on p. 37.

Chromium Chemicals

Depicting general use and diversified applications of chromium chemicals in 17 different countries, a 32-p. brochure presents data on bichromate of soda, its principal uses and manufacture, and discusses six methods of analyzing sodium bichromate. *Diamond Alkali Co.* For more information, check No. 13 on the postcard on p. 37.

Speed Reducers

Complete engineering data on Falk parallel shaft sleeve bearing speed reducers is presented in bulletin 1110, designed to provide a handy guide for designers and engineers in selecting the light Falk unit for a specific job. *Falk Corp.* For more information, check No. 14 on the postcard on p. 37.

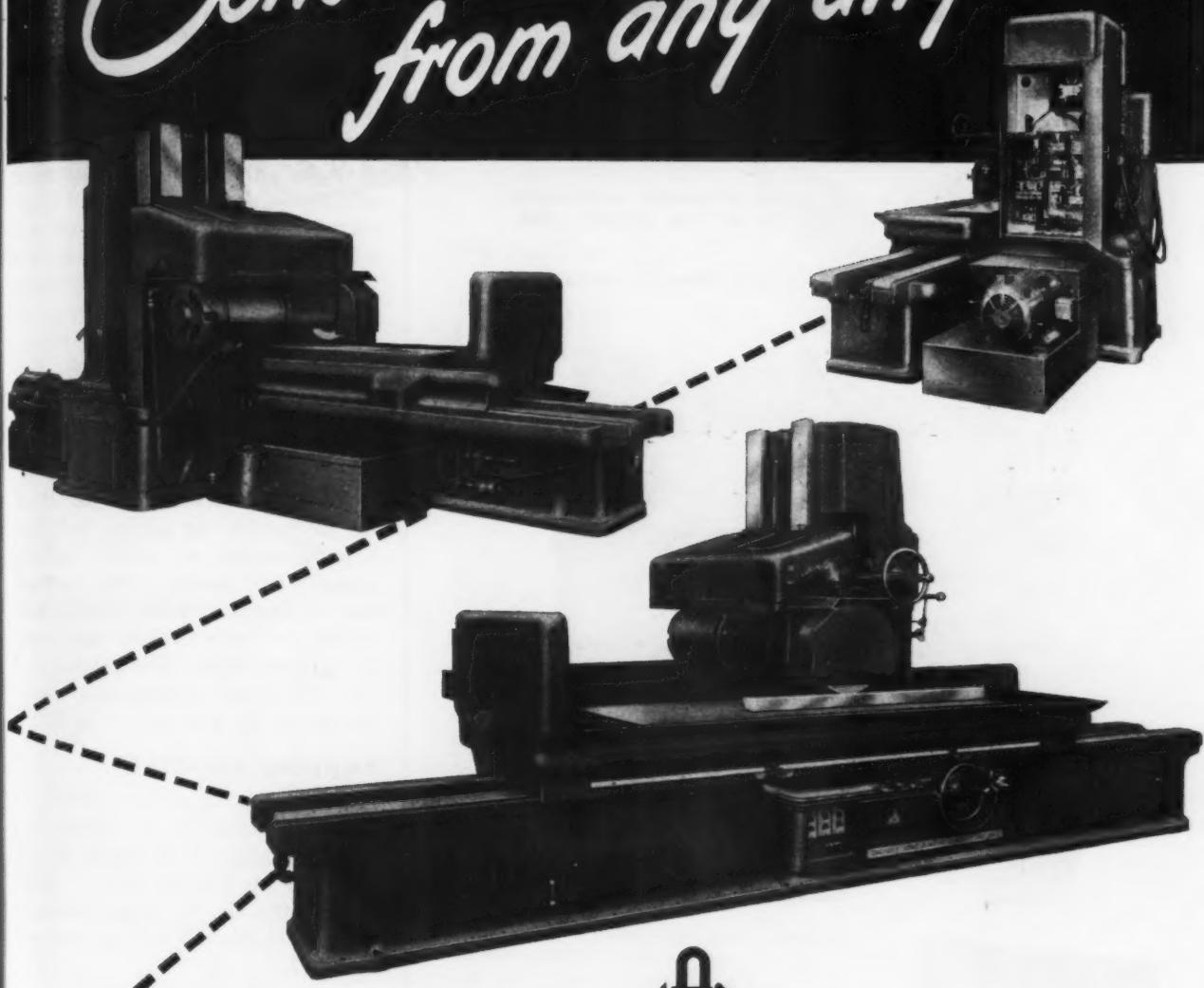
Disc Clutch

Engineering Drawings, cut-away illustrations and complete specifications for eight standard sizes of Maxitorq floating disc clutches, rated from $\frac{1}{4}$ to 15 hp at 100 rpm in single or double types, wet or dry, are given in the expanded 1950 catalog. *Edward W. Robotham & Co.* For more information, check No. 15 on the postcard on p. 37.

Carbide Applications

All tungsten carbide manufacturers' grade recommendations for chip removal, wear and impact applications are presented on a chart listing proper grades for chip removal on steel and nonferrous ma-

*Considered
from any angle*



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**The HILL Horizontal Spindle
Hydraulic Surface Grinder
includes these Advantages:**

- **PERMANENT ACCURACY**
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"HILL" Horizontal* Spindle Surface Grinders are ideal for grinding to close tolerances on flat or irregular surfaces. Made in table widths of 18", 24", 30", and 36" with table lengths from 5 to 20 feet. Write today for Bulletin G-350.

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"HILL" GRINDING AND POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING THREADING • TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • PORTABLE FLOOR CRANES • "CLEVELAND" KNIVES • SHEAR BLADES

THOMAS

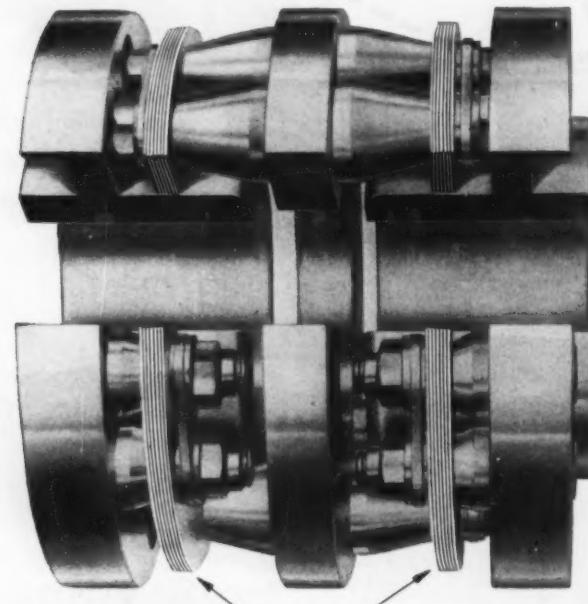
Flexible ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes: $\frac{1}{2}$ to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



**BACKLASH
FRICTION
WEAR and
CROSS-PULL
are eliminated
LUBRICATION IS
NOT REQUIRED!**

THE THOMAS PRINCIPLE GUARANTEES
PERFECT BALANCE UNDER ALL
CONDITIONS OF MISALIGNMENT.

• • •

NO MAINTENANCE PROBLEMS.

• • •

ALL PARTS ARE
SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

FREE PUBLICATIONS

Continued

terials, from roughing cuts through precision boring. *Adamas Carbide Corp.* For more information, check No. 16 on the postcard on p. 37.

Aluminum Extrusions

The basic engineering principles that will enable the designer to use extruded aluminum shapes most effectively are explained and illustrated in the new 138-p. book entitled "Designing With Aluminum Extrusions," available to engineers, architects, designers and others requesting a copy on company letterhead. *Reynolds Metals Co.* For more information, check No. 17 on the postcard on p. 37.

Chucks and Collets

New manual tells how to speed up production by giving multiple spindle range to single spindle presses and radial drills through use of Quick Change chucks and collets for both vertical and horizontal operations. *Scully-Jones and Co.* For more information, check No. 18 on the postcard on p. 37.

Lapping Machine

Folder describes and illustrates the Taft-Peirce 24 in. rotary lapping machine, lists prices of the machine and accessories. *Taft-Peirce Mfg. Co.* For more information, check No. 19 on the postcard on p. 37.

Steel Sidewalls

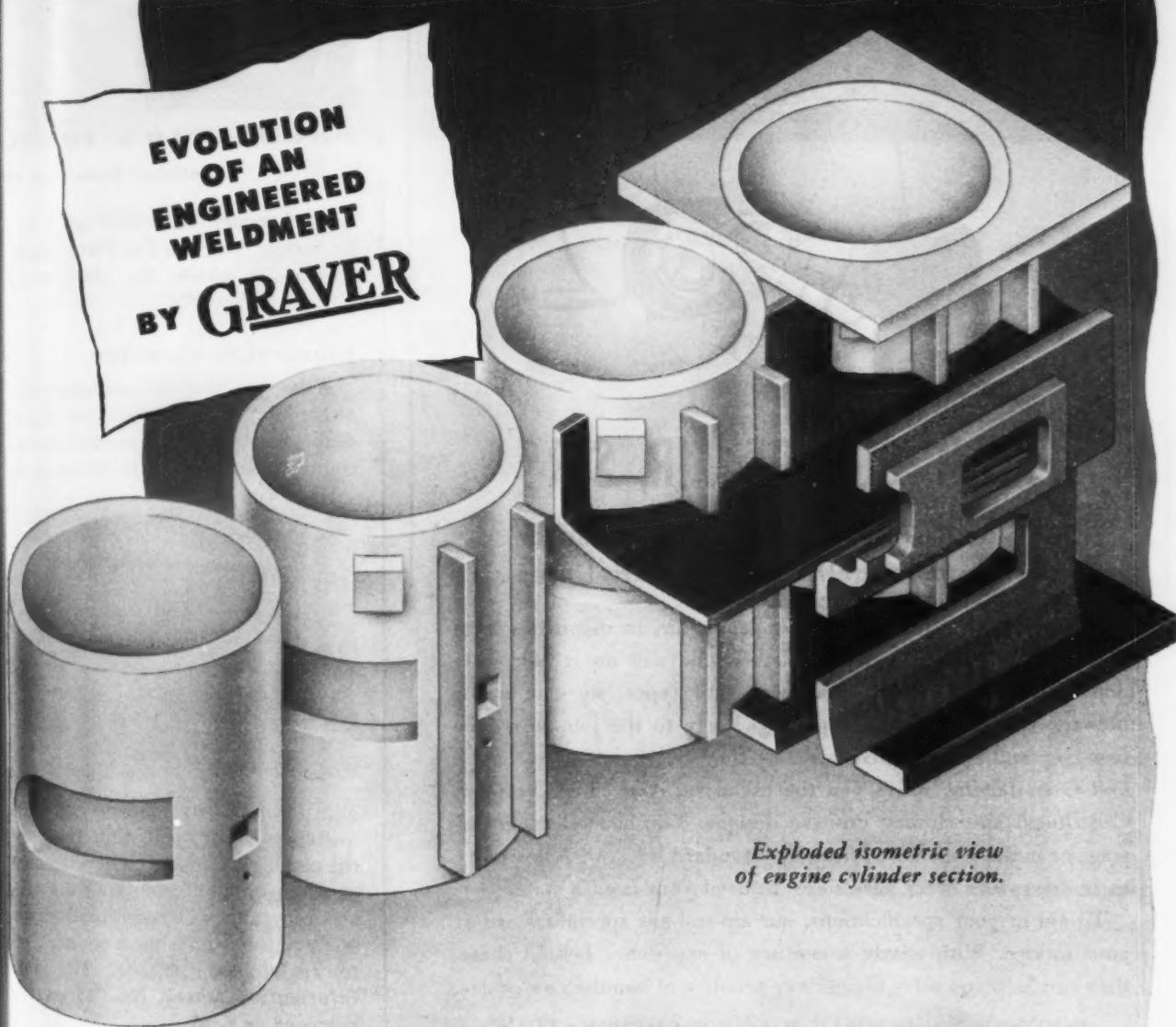
Mahon insulated steel sidewalls and prefab wall panels, made from 18 and 20-gage galvanized steel, stainless steel, or aluminum, are shown in an 8-p. catalog illustrating construction details and typical applications. *R. C. Mahon Co.* For more information, check No. 20 on the postcard on p. 37.

Steel Joists

A wide range of standard steel joists with spans varying from 25 to 72 ft and having loading capacities of 200 to 700 lb per lineal ft are listed in a new 12-p. booklet. *Dominion Bridge Co., Ltd.* For more information, check No. 21 on the postcard on p. 37.

Resume Your Reading on Page 37

EVOLUTION
OF AN
ENGINEERED
WELDMENT
BY GRAVER



*Exploded isometric view
of engine cylinder section.*

Whether Graver does the designing or works with prints furnished by you . . . every weldment job is handled as a special assignment.

For example; follow the step-by-step production of a crankcase through the Graver Weldment Division . . . (1) casting prints received from customer . . . (2) crankcase designed from prints by Graver engineers . . . (3) mathematically analyzed for compliance with operating conditions and loads . . . (4) final design approved . . . (5) scale model constructed for production analysis . . . (6) production costs and procedure established . . . (7) initial structure hand assembled . . . (8) fully analyzed under actual running conditions . . . (9) summary of test and production figures prepared and analyzed for optimum production and lowest cost . . . (10) unit put in production. *The Results*—A Graver Weldment at the lowest possible cost . . . incorporating the greatest strength with the least possible weight.

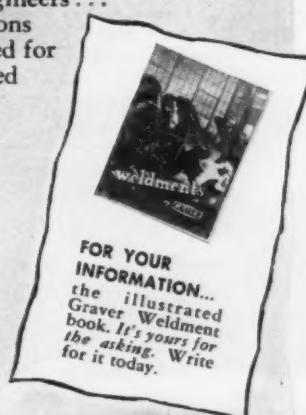
See how the Graver step-by-step method of "Welded Steel Fabrication" can be applied to your weldments. Write for full information and quotations.

GRAVER

WELDMENT DIVISION
GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, INDIANA

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FRESH OUT OF AIR, SIR?

Call on R-C dual-ability to move air or gas in any quantities for industrial uses

When you have a job of handling gas or air, in quantities from 5 cfm to 100,000 cfm, Roots-Connersville will do it efficiently and economically. With many sizes and types, we can match blowers, exhausters and gas pumps closely to the job, to reduce first cost and operating costs.

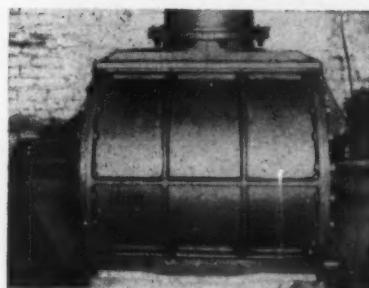
R-C dual-ability offers you the exclusive, *dual* choice between Centrifugal and Rotary Positive designs. You can select single-stage or multi-stage units, from our standard lines, with flexibility as to drives and other accessories to meet your needs.

To aid in your specifications, our air-and-gas specialists are at your service. With nearly a century of experience behind them, they can help you solve almost any problem of handling air or gas.

ROOTS-CONNERSVILLE BLOWER CORPORATION
502 Ohio Avenue, Connersville, Indiana

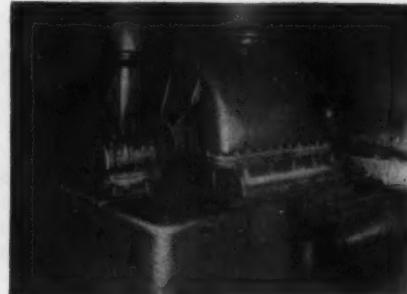


Battery of five Centrifugal gas units in steel mill. Capacities: 3-stage exhausters, 18,000 cfm each; 5-stage boosters, 20,400 cfm each.



Foundry installation of Type RCS Rotary Positive Blower. Capacity 4,400 cfm.

ROTARY



Roots-Connersville
ONE OF THE DRESSER INDUSTRIES



NEW

PRODUCTION IDEAS

Continued from Page 40

in. and model No. 3 tool has 2 to 4 in. range. *Maxwell Co.* For more information, check No. 34 on the postcard on p. 37.

Electronic Counter

A new high-speed predetermined electronic counter features direct dial setting of the predetermined count. Selection of the count is ac-



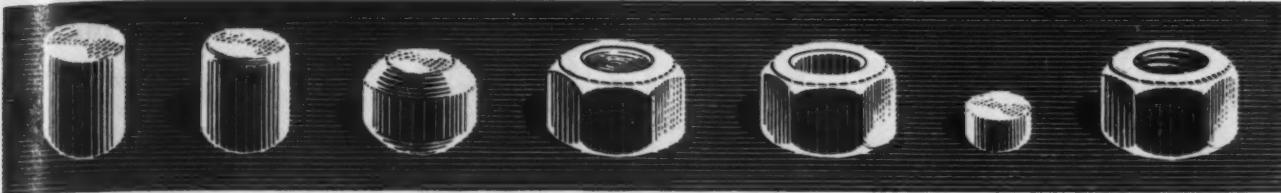
complished by means of dial switches located on the front of the panel. The instrument will count at rates up to 60,000 per min with accuracy and will reset instantaneously without missing a count. *Potter Instrument Co., Inc.* For more information, check No. 35 on the postcard on p. 37.

Air Cleaner

Trapping dust particles by means of an oil-wetted filtering element is a feature of a new, low cost air cleaner. It was designed for use



in such installations as small engines, air compressors, air presses, air cylinders, and as a crankcase breather. The new cleaner, the Donaldson Micro-Mesh, features a filtering element of uniform density woven from a single strand of copper ribbon. The element is held in



For Minimum Rejects

FROM first to last, nuts formed from Youngstown Scrapless Nut Quality Wire stand strict inspection--by magnetic particle or the usual visual inspection methods. That's because Youngstown Scrapless Nut Quality Wire comes to you so free from piping, seams, laps, die marks, internal tearing and cupping and non-metallic inclusions.

Available in various compositions including AISI standard as well as special sulphurized steels.---Cold heading bolt wire, of comparable quality, in all standard carbon analyses available for prompt shipment to the bolt and nut industry.



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PROVEN PERFORMANCE!



"PUSH-BUTTON" UNLOADING SAVES TIME, MONEY AND LABOR FOR OVER 500 USERS

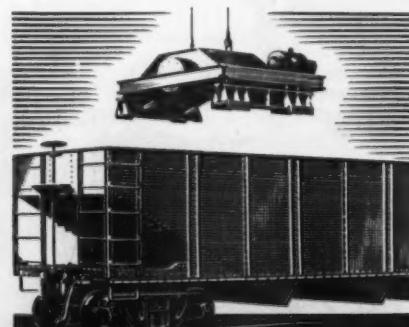
Just push a button . . . and the intense vibration generated by the Hewitt-Robins Car Shakeout does the rest. It unloads 50 and 70 ton cars in as little as 90 seconds. It unloads them no matter how tightly the load is packed.

Continuous field operation by over 500 users proves that the Hewitt-Robins Car Shakeout is actually *twelve times faster* than manual unloading. And because it empties hopper cars "broom clean," no material is left in the car. One user reports that he saves a full car of coal out of every 200 unloaded!

The Hewitt-Robins Car Shakeout practically eliminates demurrage charges. It cuts the unloading crew from five or six to two—even one. It ends damage to cars, danger to workmen . . . makes a tedious, expensive operation quick, simple and safe.

Hewitt-Robins originated the Car Shakeout; Hewitt-Robins has by far the greatest backlog of experience in vibrating car unloaders. Two models are available—Model GS for general service, where car receipts are 15

cars a day or less, and Model HD for continuous, heavy duty, high speed unloading. A note on your company letterhead to Robins Conveyors Division, Passaic, N. J., will bring full particulars about this better, *proven* way to unload hopper cars.



HEWITT-ROBINS CAR SHAKEOUT



INCORPORATED

— HEWITT-ROBINS —

BELT CONVEYORS (belting and machinery) • BELT AND BUCKET ELEVATORS
CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS
FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS
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TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

NEW PRODUCTION IDEAS

Continued

place under compression by a rigid screen that in turn is retained in the body of the air cleaner by a snap ring. The Micro-Mesh cleaner operates efficiently at any angle. *Donaldson Co. Inc.* For more information, check No. 36 on the postcard on p. 37.

Dial Bore Gage

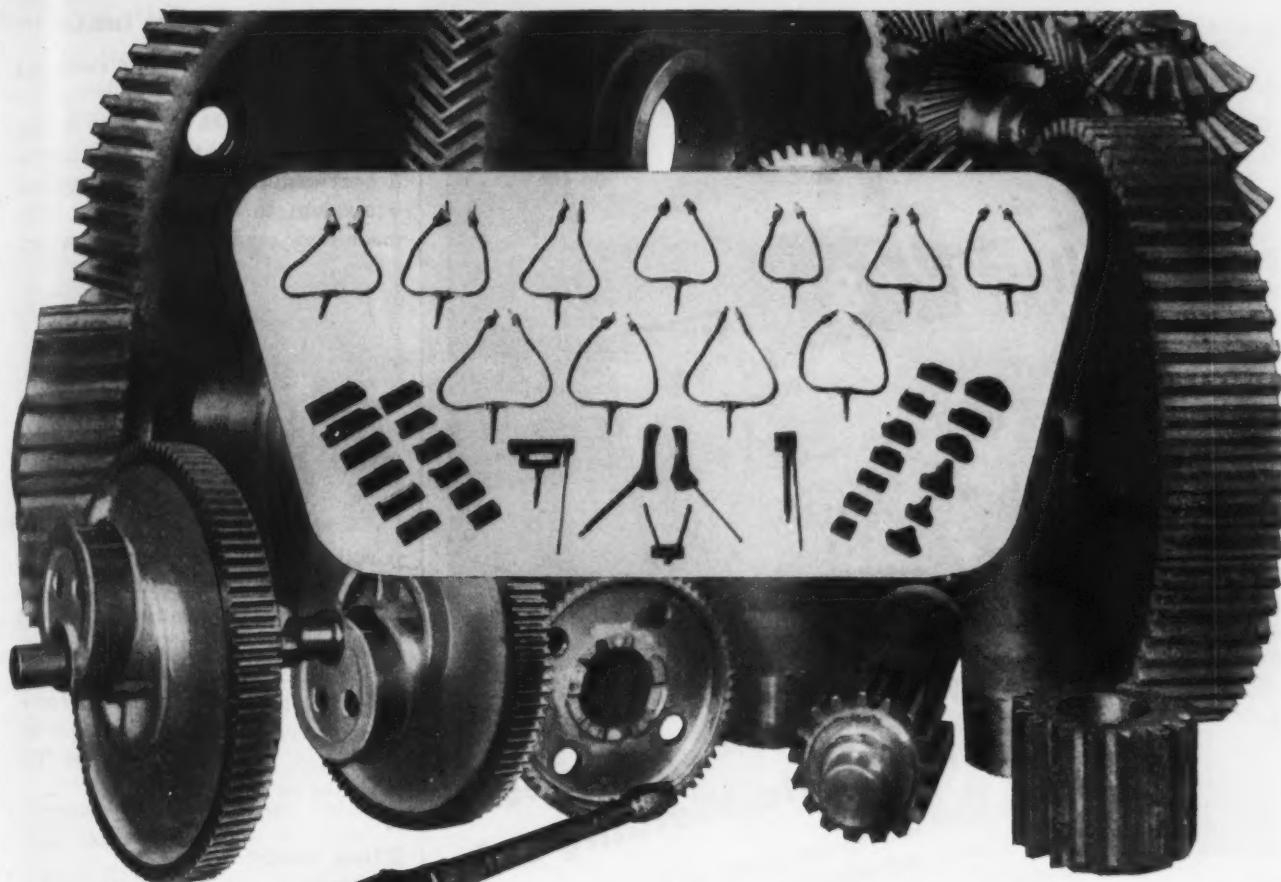
An entirely new dial bore gage will give quickly and accurately, the diameters of internal grooves for O rings, snap rings, oil rings, and diameters of straight bores. The



instrument locates on the diameter of the cut to be measured and its indicator dial immediately gives the desired dimension. Operator skill required in its use is a minimum and deep holes are measured as readily as shallow ones. Standard instruments measure diameters from $\frac{1}{2}$ to 6 in. *Rimat Machine Tool Co.* For more information, check No. 37 on the postcard on p. 37.

Steam Cleaner

Having a 300 gph capacity a super duty hypopressure Jenny steam cleaner will operate from 1 to 4 cleaning guns. It is built to do the biggest cleaning jobs and for heat-transfer uses. As a steam cleaner, the super-duty hypopressure Jenny cleans grease, grime and dirt from machinery and equipment 48 to 60 times faster than by hand methods.

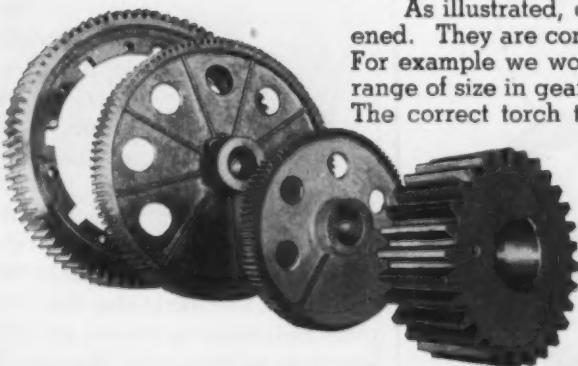


The right TORCH TIP to fit the Gear Tooth Size . . . The Secret of NE Uniformity in Flame Hardening

In the Flame Hardening heat treatment of Neloy or Neloy Moly Alloy Steel gears for the machines of industry, the right torch tip to fit the tooth size is of prime importance. Penetration of hardness to the proper depth for a given size of gear tooth, and core toughness can be obtained uniformly in no other way. Directing the flame to the teeth from a torch tip that fits the tooth size is assured at National-Erie . . . It is a standard "Must" that is never overlooked.

As illustrated, our torch tips are developed to fit the tooth size to be hardened. They are comparable in sizes to the standard range gear cutters or hobs. For example we would use the same tip for a 1 D.P. and 3" C.P. tooth. Each range of size in gear teeth requires a torch tip that fits the tooth to be hardened. The correct torch tip plus National-Erie skill in flame hardening assures the combination of a high surface hardness comparable to the carburizing or case hardened treatment, with a core toughness of a fully quenched medium carbon alloy steel.

A range of torch tips has also been developed by our engineers with the same care, for the flame hardening of track wheel treads and rope sheave grooves. They also are illustrated. Full details are yours in Bulletin No. 9. Write for it.



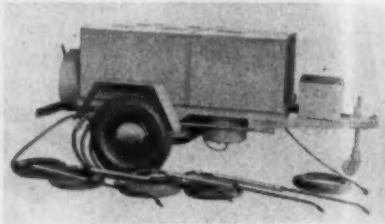
NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA • U. S. A.



Continued

it is reported. In less than 2 min, it can be changed over for use as a heat generator, with heat output equivalent to a 25 hp boiler. The machine is made in trailer mounted.



portable, and stationary models. Standard equipment includes one $\frac{1}{2}$ -in. Hypower cleaning gun, one 25-ft length each of $\frac{1}{2}$ and $\frac{3}{4}$ in. vapor hose, and either gasoline engine or 1 hp electric motor. Homestead Valve Mfg. Co. For more information, check No. 38 on the postcard on p. 37.

Flow Gage

A redesigned Magna-Sight flow gage consists of a short body, with flanged or screwed pipe connections, that accommodates a fixed orifice in the lower end. A tapered metering plug rises and falls with flow rate in accordance with variable area metering principles. The metering plug carries a permanent magnet, and a hollow, cylindrical, soft-iron follower rides in an external slot. Covering the slot is a plate calibrated in gallons per minute or in millimeters. The gage is available in brass, bronze, iron, steel and 316 stainless steel; in sizes $\frac{3}{4}$ to 4 in.; and capacities from 3.5 to 250 gpm. Fischer & Porter Co. For more information, check No. 39 on the postcard on p. 37.



RECOMMEND K

50 LBS. NET
19/9
No. D308

1/8

x 14" COLOR END-YELLOW

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This Record Safeguards Your Stainless and High Tensile Welding Jobs

The Arcos label is your assurance of uniformity from pound to pound and shipment to shipment. The alloy heat number and process number are stamped on every label. Together with the printed data on the label, this gives the information needed to match exactly any previous order at any time. Careful manufacturing controls and records of Arcos stainless and high tensile steel electrodes are the reason for the uniformity of Arcos weld metal in specified chemical, physical and metallurgical properties.

Get the Arcos "Reference Chart on Alloy Welding" from your distributor or write direct.

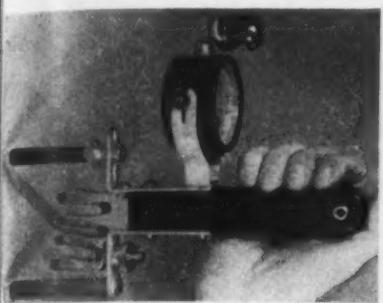
ARCOS CORPORATION
1500 South Fiftieth St., Philadelphia 43, Penna.

WELD WITH

ARCOS

Battery Cell Tester

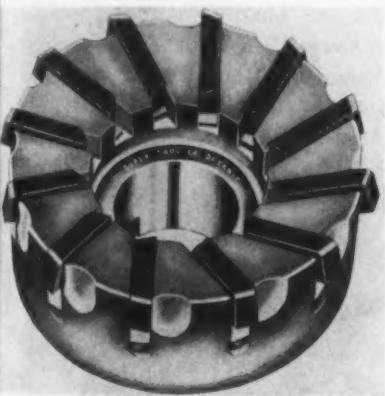
The Hy-Rate battery cell tester No. 17 instantly shows the condition of a 6 v battery. The double scale meter, calibrated 3-0-3 accurate and ruggedly constructed, instantly



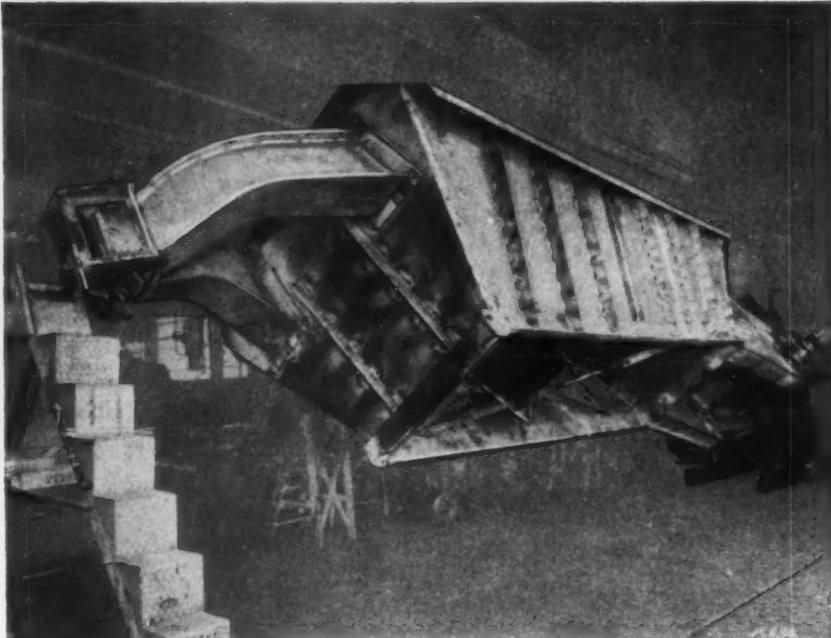
detects weakness in a battery cell. The tester is lightweight, with meter between prods. A generous size handle fits the hand and balances perfectly. Prods are adjustable and will fit the terminals on any battery. *General Scientific Equipment Co.* For more information, check No. 40 on the postcard on p. 37.

Milling Cutter

A new solid carbide insert blade cutter head for cast iron features a locking wedge that is placed below



the blade and actuated by a set screw that moves the wedge in for locking and out for blade removal. This method of locking is said to permit a greater number of blades to be incorporated in a given size cutter. Blades can be used down to approximately $\frac{1}{2}$ in. length and can be moved forward in the direction of the greatest wear. Sizes range



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Weldments Feature

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- ★ **Uniformity**
- ★ **Economy**

Yes, Van Dorn Weldments are widely known for their outstanding quality—for they are backed by Van Dorn's complete fabricating facilities . . . experienced design engineers . . . specially trained workmen . . . 77 years' experience in metal working.

Consult us about your requirements—no obligation, of course. The Van Dorn Iron Works Co., 2685 East 79th Street, Cleveland 4, Ohio.

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metal
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Swaging

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The Torrington Rotary Swaging Machine uses every bit of stock. With 4000 hammer blows a minute, swaging reduces, sizes, rounds, tapers and points rod, wire and tubing. It makes metal tougher and more resilient. It hammers away minor surface defects.

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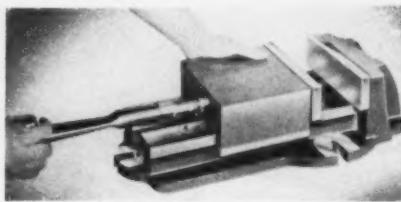
NEW PRODUCTION IDEAS

Continued

from 6 in. diam with 12 teeth to 14 in. diam with 28 teeth. *Super Tool Co.* For more information, check No. 41 on the postcard on p. 37.

Machine Vise

For use with milling machines, drill presses and shapers, a precision machine vise has jaws 8 in. wide that open to full 11 in. capacity quickly. A fractional turn of



the wrench instantly grips or releases work at any jaw opening. The body of the vise weighs 85 lb, the sliding block, 40 lb. *Ames Precision Machine Works*. For more information, check No. 42 on the postcard on p. 37.

Plate Handling Clamp

Steel plate handling clamps, horizontal and vertical, are available in a complete range of sizes to handle plate from $\frac{1}{8}$ to 6 in. and up to 12



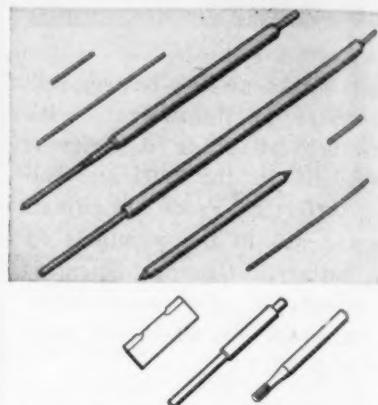
tons. The jaw bearing surface is a grooved, hardened tool steel replaceable plate. *Never-Slip Safety Clamp Div.* For more information, check No. 43 on the postcard on p. 37.

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Special equipment and volume production enable us to save for you on a wide variety of precision metal parts.

For example, special shafts and pivots are made to order for meters, instruments, speedometers, tachometers, etc. Sharp, concentric, ground or swaged single or double points. Diameters .015" to 5/16". Lengths 3/16" to 10".

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of this booklet.

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Positioner

The purpose of the model B 200 positioner with its counter-weight attachment, a vise, and friction brakes on the work table and the work arm is to hold a workpiece in the vise jaws and be able to position it about three 360° rotations. A pin lock on the table and work arm locks their rotations. Timken tapered roller bearings on the work

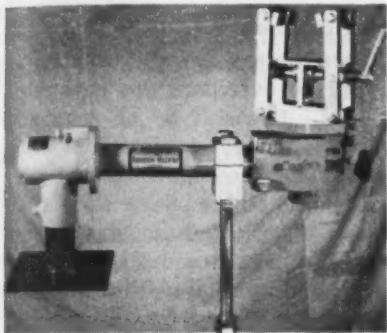


table afford free turning for light loads and ample bearing support for heavy loads. Maximum capacity is 200 lb. Aronson Machine Co. For more information, check No. 44 on the postcard on p. 37.

Work Glove

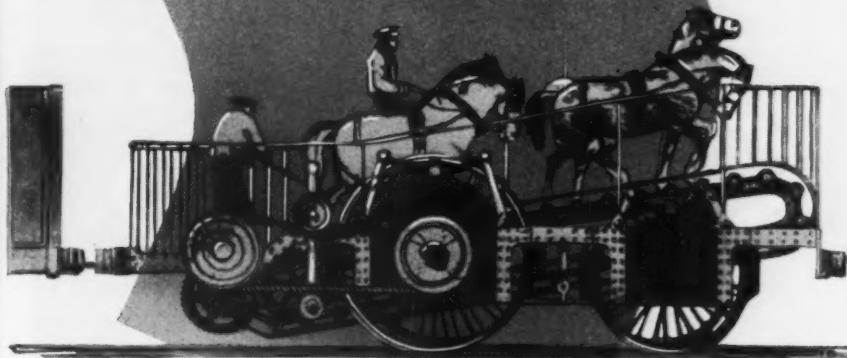
Fingers and thumbs of these oil, chemical, cutting and abrasion resistant work gloves are now molded to the natural position and curvature of the thumb and fingers and with a much wider span between



thumb and first finger. These improvements are said to give the wearer greater comfort and firmer, surer grip, reducing hand fatigue. Neox-coated work gloves are available in knit-wrists and gauntlet styles. Edmont Mfg. Co. For more information, check No. 45 on the postcard on p. 37.

Resume Your Reading on Page 41

Iron Horsepower



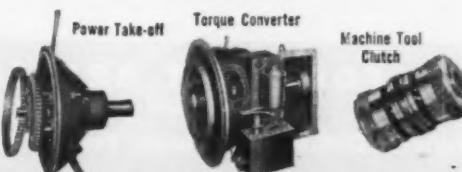
The Bettmann Archive

Records don't show whether this horse-driven locomotive actually worked. But it probably did . . . because all of the basic requirements for power generation and application were included in the design. All, that is, except one: EFFICIENCY.

Horses proved inefficient as a source of power, so they were eclipsed by infinitely more efficient engines and motors . . . just as previous conceptions of efficient power transmission have yielded to recent developments in mechanics and hydraulics.

Keeping power transmission systems abreast of rapid developments in efficient power generation has been a specialty with the Twin Disc Clutch Company for 31 years.

That's why so many leading manufacturers today . . . in construction, lumber, petroleum, farm equipment, marine and machine tool industries . . . turn to Twin Disc first for solutions to complicated power transmission problems. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).



SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918

Labor Committees Prove Inefficient in Curbing Abuses

Further evidence that any legislation attempting to curb labor abuses might have to come from a source other than either of the Labor Committees is contained in the recent report of the Senate Labor Committee on labor-management relations.

At a time when the country is trying to overcome the effects of John L. Lewis' type of economic warfare, this report describes what hasn't been accomplished and recommends nothing along legislative lines. The committee staff is reported to have attended a few meetings and gathered information from a lot of government agencies, unions and trade associations. But all it recommends is "continuation and expansion of the present investigation with full facilities for its vigorous prosecution."

The Senate in authorizing the investigation, had asked for a "thorough study of the entire field of labor-management relations."

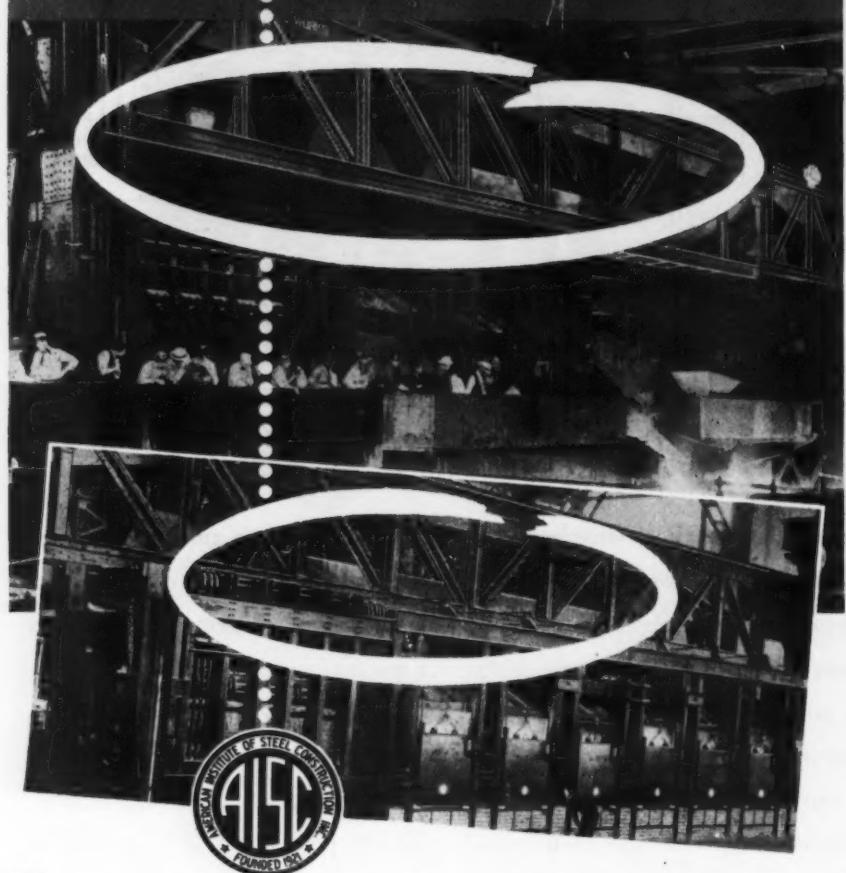
But, if the Labor Committee is still riding the political fence, other members of Congress are not. Sen. Robertson, D., Va., whose Judiciary subcommittee recently completed a study of monopolistic unions, (THE IRON AGE, Jan. 19, p. 48), has taken the bull by the horns and introduced a bill to again place unions under the antitrust laws if they unreasonably restrain commerce. Strikes having such an effect could then be enjoined by the courts.

The significance of this move lies not so much in the limited probability of passage. In fact, hearings are not even likely unless there is considerable public pressure. Its importance lies in the fact that for the first time there has been introduced a measure sincerely designed, after thorough study, to curb some labor abuses.

Sen. Robertson claims that his bill "would remove the immunizing effects of the Clayton and Norris-LaGuardia Acts from conduct which up until 1941 had been almost universally branded illegal and against the public interest, and

STEEL TRUSSES

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Fort Pitt Bridge—fabricated the huge twin crane runway girders at the Weirton Steel Company Open Hearth Furnace—*largest in the steel industry!* Length of each girder, 106' 1½", height of each girder, 11' 11", total weight of each girder, in place, 170 tons—or 340 tons of steel in *two runway girders*, that's a lot of steel, fabricated to exacting specifications. For your structural steel requirements call on **FORT PITT BRIDGE**.

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• News of Industry •

which had always been outlawed by the Sherman Act." The act "would then again serve, as it originally served, as a brake on unions which seek to put their own activities ahead of the national welfare," says the Virginia Senator.

This limited measure does not seek to break up national unions, in fact, the Senator says he is for them, but it would result in some equality under the law.

Long Beach Naval Shipyard To Be Abandoned in Near Future

Long Beach—Although no definite decision has been announced, latest indications are that chances of saving the Long Beach Naval Shipyard are practically gone.

New economies in the area indicate to most that there is little chance that the Navy will reverse its position and reactivate the costly ship repair operation here.

The giant Navy yard had been ordered closed with a few more men dropped off each month until June.

Navy to Close Hospital

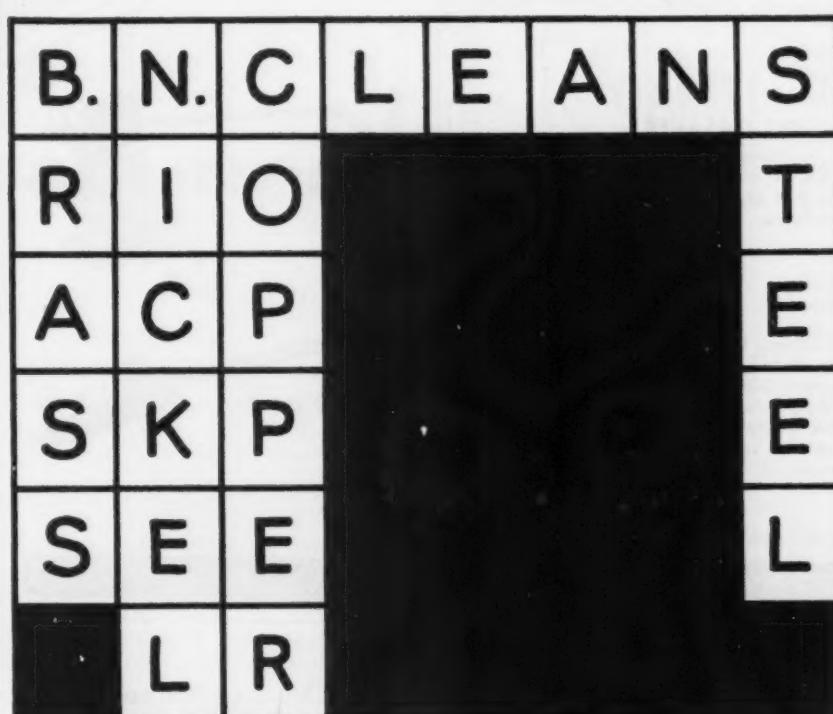
Latest blow to the plan came with an announcement that the Navy will close the last major hospital it has here. This, too, is in Long Beach. The hospital may be taken over by the Veterans Administration, but it will be cut off the 1950-51 Navy budget.

Long Beach has been campaigning to keep open the Navy shipyard which employs about 5000, including a major portion of steel workers.

Manufacturers Anticipate Increase in Water Heater Sales

San Francisco — West Coast manufacturers of water heaters anticipate that appliance sales for 1950 will run approximately 20 to 30 pct ahead of 1949 when 450,000 units were produced as compared to 487,000 in 1948. The first half of 1949 showed a sales drop of approximately 25 pct below 1948 but a large part of this decline was wiped out with a small boom in the last half of the year.

Puzzle with a point



THE POINT is that Wyandotte B. N. Cleaner is an extremely versatile product with unique advantages in many cleaning operations. It may be used with good results in the rotary tumble barrel. Because it contains a synthetic wetting agent which speeds wetting action and improves rinsing qualities, it works effectively as a still or soak tank cleaner.

B. N. Cleaner also makes an excellent all around contract or job plating electrocleaner, since one solution will serve for cleaning several metals. Steel, brass, copper, nickel and other metals may be cleaned in the same solution, with proper control.

For technical information on Wyandotte B. N. Cleaner or any other metal cleaner in the *complete* Wyandotte line, write:

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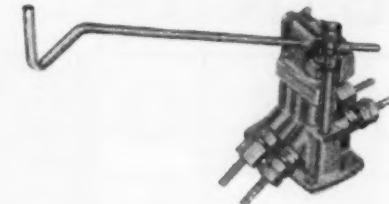
Shatter WELDING COSTS WITH WELDIMATICS

Weldimatic Welding Torch "W-46", with built-in automatic Gasaver. Time study in auto plants showed an average gas savings per man of \$4.80 per day with this Weldit Torch. Weighs only 13 ounces. No operator's fatigue.



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Weldimatic Blow Pipe "C-47", with automatic shut-off fashioned of special aluminum alloy. Features lightness of weight and fine balance. For soldering, annealing and heating jobs. Uses natural or manufactured gas, butane, and other low temperature gasses and compressed air.



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20 rough flywheel castings (3200 lbs.) are palletized at the foundry and shipped as a unit. Four Gerrard Steel Straps hold each load securely. Photo courtesy of International Harvester Co., Industrial Power Division.



Tie it tight... THAT MEANS GERRARD!

• Shippers who use Gerrard Round Steel Strapping know they do not have to worry about tightness. Once the Gerrard machine tensions, ties and cuts the strapping, they know the knot is tight and there is no danger of slippage.

The use of Gerrard Strapping in your plant will save money. Gerrard Steel Strapping costs about 40% less than any other type of metal strapping. And the simplicity of Gerrard Strapping procedures will speed up binding and packaging operations.



GERRARD
ROUND STEEL STRAPPING
UNITED STATES STEEL

Gerrard Steel Straps come in a wide range of gauges to satisfy every commercial and industrial need from tying parcel post packages to securing car-load lots of steel sheets, pipe, plate and tinplate.

Write for a free copy of *Blue Book of Packaging*. Then call a Gerrard engineer to help with the tying problems at your plant. His services are available free of charge. **Gerrard Steel Strapping Company, 4705 So. Richmond Street, Chicago 32, Ill.**

• News of Industry •

Kaiser Aluminum Plants Operate at Full Capacity

Spokane, Wash. — Operating at capacity the Kaiser Aluminum & Chemical Corp.'s plants at Mead and Trentwood now employ 1500 and 2200 respectively. Both plants are operating 7 days a week, three shifts a day and reportedly are turning out more aluminum at these two plants than was produced by the entire aluminum industry in the United States before the war. An anticipated slackening in retail demand during the winter months has not materialized and demand from processors and manufacturers is said to be well above expectations with aluminum to be fabricated into door and window frames in especially heavy demand.

R. F. Mehl Appointed to NRC

Pittsburgh—Dr. Robert F. Mehl, director of the Metals Research Laboratory and head of the metallurgical engineering department of Carnegie Institute of Technology, has been appointed a member at large of the National Research Council of the National Academy of Sciences.

Dr. Mehl, whose appointment is for 3 years, joined Carnegie Tech in 1932 as director of the Metals Research Laboratory. Before that he was superintendent of the division of physical metallurgy for the Naval Research Laboratory and assistant director of research for Armeo Steel Co.

Rewarded for Safety Record

Pittsburgh—A record of more than 2,600,000 man-hr of work without a single lost-time accident recently earned 425 Westinghouse Electric Corp. employees a Safety Oscar.

W. A. Beatty, manager of the Westinghouse Feeder Div., presented the trophy to the employees in the tool and special equipment department of the division at the company's East Pittsburgh Works. He pointed out that nearly 3 years have elapsed since a lost-time accident occurred in the department on Apr. 17, 1947.



Dear Customer

by

Jack R. Night

WELFARE PROGRAMS—Next week we will publish the second special article of the year—a feature from the typewriter of Bill Packard, news-markets editor. His special interest in employee relations, labor negotiations, and what is now termed human relations long predates his association with **THE IRON AGE**.

In addition to his regular desk editing duties and his management of a staff of field editors, he keeps in close touch with employee relations matters yet today. For next week's issue he has analyzed a great number of employee welfare programs. He has paid particular attention to those that have failed.

The result is that he has been able to arrive at some generalizations to account for a number of failures. Is your company spending increasing sums on various worker-welfare plans? Have you discovered that even as expenses go up, morale can go down?

Mr. Packard's exposition will explain a number of reasons why that can and does happen. Not only that, but he will come up with a group of suggestions to prevent such an occurrence in your firm. A valuable check list will be included to tell you how your firm

stands. All in all, it is going to be quite a package. It will be a worthy followup for the special housing article that appeared in the Jan. 26 issue. Watch for the special report next week.

TOOL ENGINEER'S ISSUE—Our Mar. 30 issue will be devoted to the interests of the tool engineers of the world. Following the outstanding success of our special annual review issue last month, it is expected to be even more important. This publication date will immediately precede the convention and exposition of the American Society of Tool Engineers in Philadelphia Apr. 10-14.

The machinery editor of **THE IRON AGE** is gathering a series of feature articles on tooling subjects—and will publish an engineer's notebook of items where we can give a case history of cost saving. By the way, if you haven't sent your product description and case history in to him yet, rush it in to Tom Lloyd, machinery editor, 100 E. 42nd St., N. Y. 17, N. Y. He wants to know—in every case, what the production problem was, how it was solved, and what savings resulted. These will be real cost-cutting meat for every reader.



"The big parts
are ready.
We cleaned 'em
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OAKITE Steam Gun"



HERE'S an easy, low-cost way to clean metal parts that are too large to be soaked in tanks or conveyed through washing machines.

Just use the Oakite Solution-Lifting Steam Gun to apply an Oakite cleaning solution under about 40 pounds of steam pressure. Oil, grease and other dirts vanish quickly, leaving parts ready for inspection, assembly, further machining, pre-paint treatment, etc. (The same gun applies Oakite paint-stripping solutions under low pressure.)

FREE For illustrated folder F7338—telling more about the money-saving Oakite Steam Gun—write to Oakite Products, Inc., 30H Thames St., New York 6, N. Y.

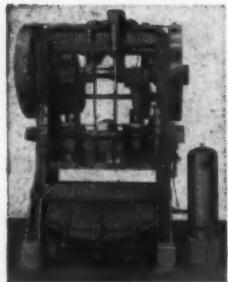
ALSO ask about Oakite procedures for:

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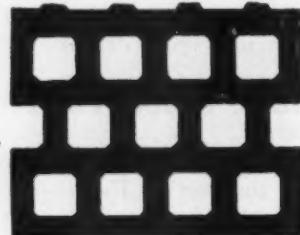
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FATIGUE CRACKS

Continued from Page 22

that the new term comes from the Greek word for "steersman," a point confirmed by the others. And Miss Mildred R. Lasser, head of the technology department at the Bridgeport Public Library, refers us to the subtitle of Dr. Wiener's book: "Control of Communication in the Animal and the Machine." If we had one of these mechanical monsters to read Dr. Wiener's book for us, we could probably tell you more.

Puzzlers

At this point, everything from simple reasoning to higher (for us) mathematics has been used to empty the barrel with three spigots. Add to the list of those who know the answer Frederick E. Schmitt, Jr., Hercules Powder Co.; M. V. Dreyfuspool, who deals in barrels and spigots; W. B. Farnsworth, Linde Air Products; John H. Fage, Jones & Laughlin; R. B. Vassier, Wagner Electric; Fritz Fisher, Wirebound Box Manufacturers Assn.; Henry H. Germain and John Faust, National Radiator.

On the 4 weights needed to weigh from 1 to 40 lb with a balance we have the answer as 1, 3, 9, and 27 lb from Ray A. Stevens, American Institute of Tack Manufacturers; L. W. Alexander of Kennametal; R. F. Meyers; J. A. Davenport; and Mr. Schmitt, who adds that he can weigh everything up to 121 lb with five weights and up to 364 with six weights.

John M. Bigler asked last week: If you take a rod of steel weighing 60 lb, draw it out 3 ft longer, and find it weighs 1 lb less per lineal ft, how long is it. He says the answer is 12 ft.

Here is a code problem, submitted in slightly varying forms by W. B. Farnsworth of Linde Air Products and Robert Putnam of Ritter Co., Inc.: A scrap buyer had a code worked out with his home office so that he could wire for money in code. Each digit from 0 to 9 was represented by one code letter. The first day he wired, "Wire me \$SEND." The second day out he wired, "Wire me \$MORE." The third day he received a wire from his office requesting him to verify the sum of money of the two amounts. He wired back, "The sum is \$MONEY." What were the respective amounts? Mr. Farnsworth says his friends took from 15 min to 2 days to get the answer.

Resume your reading on page 23

All-Time Safety Records Set by Coal Industry in '49

Washington—Three new safety records were set in the coal mining industry in 1949, according to the Bureau of Mines reports. Both the fatality rate and total deaths were lowest in history and 1949 was the first calendar year to pass without a major disaster (causing 5 deaths or more).

While rate statistics are not complete for metal mining, fewer men suffered fatal and non-fatal injuries. Preliminary figures show 90 deaths and 6800 injured compared with 101 deaths and 7515 injuries for 1948.

Coal mine deaths last year totaled 593 compared with 1010 in 1948. Reduced to a tonnage basis, the 1949 fatality rate was 1.24 per million tons compared with 2.41 in 1939.

Byers Showdown Put Off

Pittsburgh—Final determination of whether a minority group shall place three men on the board of directors of A. M. Byers Co. has been postponed until Feb. 14. After a test of strength showed that the opposition committee of stockholders had enough votes to seat their three candidates, the management group challenged proxies of shares voted by brokerage houses. A committee of judges will investigate and make a decision Feb. 14. In the test, Byers management voted 200,242 shares and the minority group 72,611, or 27 pct, more than enough to name their candidates—A. S. Karp, New York attorney; Gerald B. Nielsen, New York broker, and J. Allen Harlan, Dayton engineer.

Apprentices Complete Training

Washington—Nearly 73,000 apprentices will complete apprenticeship this year and be added to the skilled worker labor force this year, the Labor Dept. reports.

Included are 9781 auto mechanics, 3071 machinists, 1842 toolmakers and die sinkers, and 3413 plumbers and pipefitters.



The knurling on the head of the UNBRAKO Socket Head Cap Screw saves valuable assembly time because the UNBRAKO can be screwed in faster and further with the fingers—the handiest of all wrenches—before a wrench is needed. The slip-proof knurling "gears" the screw to the fingers, even when they are oily or greasy . . . this is especially important in the smaller sizes.

So, use Knurled UNBRAKO Socket Head Cap Screws and save time and money.

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• • News of Industry • •

West's Aluminum Industry Slated for Continued Growth

San Francisco—All factors indicate that production and finishing of aluminum will continue to be an important segment of the metals industry of the West.

Kaiser Aluminum & Chemical Corp. produced approximately a quarter of a billion lb of primary aluminum in 1949 to bring the total production for this company since 1946 to 775 million lb.

Reduction facilities of this company at Mead, Wash., for producing basic aluminum are now operating at capacity with renewal of interruptible power from Bonneville.

Kaiser Aluminum reported an increase of 163 pct per share in net earnings for the second quarter ending Nov. 30 of last year which amounted to approximately \$1.80 per share.

Reynolds Metals Co. has strengthened its aluminum production and finishing position in the West with the purchase of the reduction plant at Troutdale, Ore., and the aluminum extrusion plant at Phoenix, Ariz. Both plants have been operating under lease arrangement with the federal government.

Alcoa's wire and rod mill at Vancouver is expected to get into production early this year.

Although unconfirmed by officials of the Harvey Machine Co. of Torrance, Calif., the Nevada-Colorado River Commission has announced that it has accepted an offer from that company for the purchase of facilities at Henderson, Nev., to be used for the production of basic aluminum. Harvey has been an important factor in southern California in the production of aluminum and magnesium extrusions and machined parts.

LITTELL STYLE "M" ROLL FEEDS

SAVE your operators' fingers! Accidents mean lost production, lowered morale. Littell automatic Roll Feeds prevent most accidents on your punch presses.

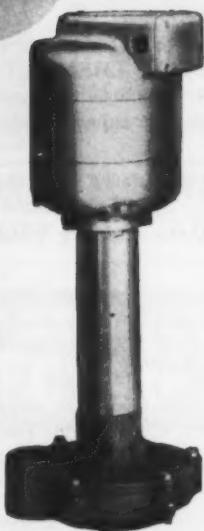
Littell automatic Roll Feeds eliminate any need for the operator to place his hands between the punch and the die. The Roll Feed moves coil stock through the press with greater combined speed and precision than is possible manually. Yet the operator is not endangered. That's why the lowest insurance rates are given to presses equipped with automatic feeds. Add this saving to your profits.

Littell Style "M" Roll Feeds are available in many sizes. They are easily mounted for right or left hand drive. They can be fitted with 3-roll straighteners. Write today for full details; learn how Littell Roll Feeds can raise your output.

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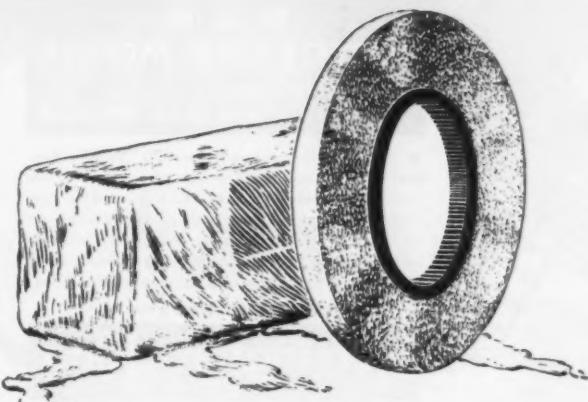
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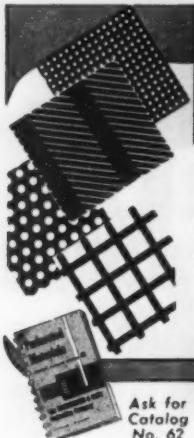
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IRON AGE INTRODUCES

Continued from Page 159

O. A. Tucker has been appointed vice president in charge of sales and general administration for the PACIFIC CAR & FOUNDRY CO., Renton, Wash. He had previously been vice president in charge of operations.

L. R. Gustin, formerly general foreman of the bolt and nut department of BETHLEHEM PACIFIC COAST STEEL CORP., Los Angeles, has been advanced to the position of assistant superintendent of that unit.

Lyman W. Slack, formerly associated with Pontiac and Packard Motor Car Co., has been named vice president in charge of distribution of the WILLYS-OVERLAND CO.

George Romney, assistant to the president and formerly director of the Automobile Mfg. Assn., has been named a vice president of NASH-KELVINTON CORP.

J. W. Herman, treasurer and assistant secretary of the LUKENS STEEL CO., Coatesville, Pa., has been elected a director of the AMERICAN MACHINE & FOUNDRY CO., New York.

C. Paul Young becomes government sales manager, George A. Hagerty, commercial sales manager, and William M. Carey, operations manager, for the industrial division of PHILCO CORP., Philadelphia.

Harold E. Farris was named to the post of manager of field sales for AMERICAN KITCHENS, American Central division, Avco Mfg. Corp. Mr. Farris will make his new headquarters at the American Kitchens plant, Connersville, Indiana.

Charles B. Belknap, of the Owens-Illinois Glass Co., was elected to the board of directors of ARTHUR D. LITTLE, INC., Cambridge, Mass., research and engineering company.

George S. Ashmun was made general superintendent of the Otis Works, JONES & LAUGHLIN STEEL CORP., Pittsburgh. John M. McColloch, formerly superintendent of the finishing divisions at Otis Works, will succeed Mr. Ashmun as assistant general superintendent.

J. Sterling Davis has been elected treasurer and a member of the board of directors of NATIONAL ELECTRIC PRODUCTS CORP., Pittsburgh.

C. J. Marlett, representative for KENNAMETAL, INC., in the Chicago district during the past seven years, has been transferred to their engineering department at Latrobe, Pa.

James E. Allison was promoted to the position of assistant superintendent of pipelines of divisions 1 and 2, the TEXAS GAS TRANSMISSION CORP., making his headquarters in Owensboro, Ky.

OBITUARIES

Alan E. Ashcraft, for many years a director and vice president in charge of manufacturing, Fairbanks, Morse & Co., Chicago, died on Jan. 23.

George Warren Camp, 76, associated with the Ward Leonard Electric Co., Mount Vernon, N. Y., for 57 years, died on Jan. 23.

James F. McKeone, 61, superintendent of the Vulcan Steel Foundry, Wilkes-Barre, Pa., died on Jan. 24. Mr. McKeone had previously been superintendent of the Strong Steel Foundry Co., Buffalo.

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THE IRON AGE



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100" Niles Bement Pond. Extra heavy type. 2 swivel heads, power rapid traverse, 35 HP direct current motor.

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15 ton 36" stroke American vertical duplex surface with tilting type workholder.

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42 spindle, No. B16 Natco multiple with 18" x 48" drilling area and two box tables.

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Type T Barber Colman. Designed for either straight or taper splines, helical or spur gears. Also type A and Nos. 3 & 12 Barber Colmans.

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6" x 18", No. 10 Brown & Sharpe "Electric Hydraulic" Three with and two without spindle oscillation. New 1940 and 1941.

10" x 36" Norton type C hydraulic with hydraulic quick in-feed. Serial No. C16458, new in 1942.

10" x 72" Norton type C hydraulic made at factory to swing 14". Serial No. 21750, new in 1944.

23" x 36" Norton type C with mechanical table traverse, hydraulic quick in-feed. Serial No. C18281, new 1943.

LATHE TURRET

No. 2FU Foster Fastermatic Serial No. 2FU529, new in 1944. Quite a little tooling.

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Cincinnati Hydromatic Sizes: 3-24, 34-36, 4-36, 4-48, 5-48, 56-72 and 56-90.

PRESSES

1000 ton, No. 666 Toledo knuckle joint Coining. 2 1/2" stroke, 18" shut height, bed 37" F to B x 31" R to L.

350 ton Clearing Crankless, model F1350-42, serial No. 45-11155P, new 1945. 20" stroke, 28" shut height, 36" x 42" bed.

600 ton Hamilton No. 2316 1/2 eccentric shaft forging. Stroke 4"; shut height 16", bed 28" F to B x 23 3/4" R to L.

No. 506 Bliss on inclined legs with double roll feed and scrap cutter. About 126 tons. 3" stroke, 11 1/2" shut height.

1000 ton Baldwin Southwark "Hy-Speed" hydraulic. 20" stroke, 56" daylight, bed 42" F to B x 54" R to L.

UPSETTERS

2" National. Serial No. 13213. Has suspended slides with long overarm guide. Has 15 HP motor.

4" Ajax. Serial No. 3156. Has twin drive gears, suspended slides, self contained backshaft, 30 HP motor.

MILES MACHINERY CO.
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THE CLEARING HOUSE

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

Over 190 electrical dealers attend NISA technical meeting in Philadelphia

Mixed trends reported by New Haven machine tool dealers

Used machinery appraisal form published by Research Institute

Over 190 NISA Members Attend Philadelphia Technical Meeting

Philadelphia—Four National Industrial Service Assn. chapters along the northeastern seaboard held a joint session in Philadelphia on January 14, under the auspices of the Quaker City chapter. Over 190 men registered for this Philadelphia meeting. After the morning inspection trip through the Westinghouse M and R plant, there was a luncheon at the Penn Sheraton Hotel. Following this was a technical session featuring a speaker from each chapter.

Hector Monroe, New England Machine & Electric Co., Pawtucket, told of methods developed to waterproof windings using a treatment of Silicone 996. J. Heller, Consolidated Electric Motor Co., New York City, discussed uses of various testing instruments in repair shops. Dick Harris, Electric Equipment Co., Washington, D. C., advocated broadening and liberalizing rebuilt motor guarantees. Howard Davies, Philadelphia, summarized results of tests that show the influence of number of turns, wire size, rotor resistance, capacity of capacitors and other factors on the starting and rimming performance of single phase motors. Ralph O. Kufen, O'Brien Machinery Co., Philadelphia, spoke on customer conversion requirements.

The afternoon session closed with a discussion of the Wage-Hour amendments led by president R. E. Ward.

Over 150 guests attended the evening dinner. Entertainment was provided. The serious talk of the evening was presented by Honorable John H. Bartram, who warned of the crushing load of government activities.

Inquiries Reported Good; Trends Mixed in New Haven

New Haven—Machine tool dealers in this area report mixed trends. Most dealers admit that inquiries are still holding up well. Those that have the particular machines asked for are turning them over fast, others not so fortunate in having complete stocks, can't close the sales.

New Haven dealers have found that only the later type machines are in demand and that locating sources of these newer models grows increasingly more difficult each month. Where lively activity was reported, equipment such as tool room items, heavy mills, radial drills, and engine lathes were said to be moving.

Machinery Appraisal Form Published by Research Institute

Chicago—An appraisal form, claimed to be the first of its kind for used and rebuilt machinery, recently has been published by the Research Institute for Used Machinery and Equipment Dealers. This organization, established by

Turn to Page 186

THE IRON AGE

phosphates in Brazil. The raw materials are to be imported from Africa until Brazilian supplies are obtainable, a company spokesman said. Part of the capital of the company will be advanced by Swiss interests at 6 pct per annum for 8 years.

British Instrument Makers Urged to Give Canada Priority

London—British manufacturers of tools and scientific instruments have been asked by the British government to give outright priority to Canadian orders, "even if this means substantial diversion from non-dollar markets," according to the Bulletin of the British Tool and Scientific Instrument Assn.

Devaluation of the pound has made the British product competitive in price, the Bulletin says, and there is recognition by informed Canadian users that British tools are unsurpassed both in quality and performance. Against this is the obstacle of long deliveries quoted by many British manufacturers. It is to overcome this that the U. K. government has asked outright priority be given to Canadian orders.

Diverting Orders Insufficient

Confining diversion of priority to new orders is not enough, however, the Bulletin pointed out. It is necessary to adjust to existing production programs, and to divert materials, work in progress and even finished orders, to Canadian orders if the industry hopes to establish itself on an expanding basis in a market that is accustomed to early deliveries from the United States.

The industry is also advised that the U. K. government, appreciating the cost to individual firms of breaking into the Canadian market, and the commercial risks involved, will be prepared, through its Exports Credit Guarantee department, to consider any sound proposition for increasing existing dollar earnings or developing new ones.

Develop New Industrial Tractor

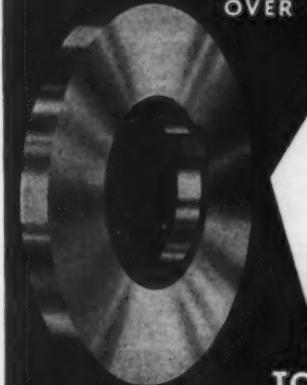
Surplus capacity at the Ferguson plant at Coventry, due to the fall in sales of farm tractors, is to be utilized to produce an industrial tractor. It will embody the chief characteristics of the present agricultural tractor, but modifications will be introduced to enable it to lift and carry heavy loads. Nearly a year ago agricultural tractor production had to be cut back owing to disappointments in the Argentine and French markets. From a low of about 500 tractors a week production has climbed to just over 1,000 a week at present. This is about half the capacity of the plant.

Resume your reading on Page 31

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